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VOL. XXXIV. JULY—DECEMBER, 1856.

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THE

RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

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A SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOLLOWING PAGES: SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

AFFECTIONS OF THE SYSTEM GENERALLY.

FEVERS.—We believe that all malignant fevers require powerful stimulants of every kind; and of all therapeutical agents quina, in large doses, is the most valuable. In purely nervous cases we should expect it cutting short the disease; in those where the blood is primarily diseased, it will neutralize the tendency in the diseased blood to produce disordered functions of the sympathetic nerve, and will thus keep the patient alive until the diseased blood has been thrown out of the system by crisis. (Dr. W. J. Cummins, p. 1.)

MALARIA.—For producing malaria it appears to be necessary that a surface should be flooded and soaked with water and then dried. The quicker the drying process, the more virulent is the poison that is evolved. For this reason Dr. A. T. Thompson recommended that the floor of a sick room should only be swept, never washed. An invalid might as well sleep in a swamp as in a room the floor of which is frequently washed. Dr. Alison has observed the more frequent occurrence of croup on Saturday night, the only day of the week on which the lower classes of Edinburgh wash their houses. (Dr. C. H. Jones, p. 3.)

RHEUMATISM, &c.—*Acupuncture.*—In cases of a constitutional origin, depending upon some morbid material, which must be eliminated before we can expect a cure, acupuncture will do no good. But in all cases not having a constitutional origin, and not depending on an inflammatory state, or organic disease, such as lumbago, sciatica, or pleuralgia, especially if they are benefited by heat, we may confidently affirm that acupuncture will not only afford relief, but in most instances effect a cure. (Dr. J. T. Banks, p. 12.)

AFFECTIONS OF THE NERVOUS SYSTEM.

CEPHALALGIA.—This often comes on from any exposure of the head to cold air, and is then generally removed by a cup of strong coffee, or a dose of the hydrochlorate of morphia. If these fail when given separately, they will frequently effect an immediate cessation of the pain when given in combination. (M. Boileau, p. 20.)

Convulsions.—Chloroform, when cautiously exhibited, even to very young children, often gives immediate relief; if the fit returns when it is not given, the effect may be kept up by occasional respirations for several hours without danger. (M. Marotte, p. 20.)

Dumbness and Aphonia.—If you have reason to believe that it depends upon paralysis of the genio-glossi and the muscles connected with the chordæ vocales, you may derive wonderful benefit from inductive electricity, one pole being placed on the tongue and the other on different parts of the neck. (Prof. Sedillot, p. 20.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

Aneurism.—There are few or no cases of popliteal aneurism in which the cautious use of pressure is not justifiable. The contra-indications to its continued use I should consider to be, a shattered irritable constitution, its close proximity to the knee-joint, and a very free communication with the artery by a large opening, which may be judged of by the loudness of the murmur and the time which the tumour requires to fill. (Mr. T. Holmes, p. 175.)

Nævus.—There are many cases in which the knife cannot be used, and in such the perchloride of iron answers very satisfactorily. It must be forced in through several punctures by the small glass syringe which holds about half a drachm. The piston is worked by a silver screw, two half turns constituting a drop. (Mr. Lawrence, p. 177.)

In cases where excision is impracticable, there is no better caustic, when it is desired that they should disappear quickly and certainly, than a solution of four parts of deuto-chloride of mercury in thirty of collodion. It should be applied with a camel's hair brush. (Dr. Macke, p. 388.)

Varicose Veins.—The "Vienna paste" is much safer than the ligature. Mix two parts of caustic potash, and three parts of fresh lime into a paste with a little spirit of wine. A small hole must be cut in the centre of several thicknesses of adhesive plaster, and placed over the varicose enlargement; put a small bit of paste into the hole, allow it to remain about twenty minutes, then wash it off and apply a large poultice. Eight or ten such eschars are generally sufficient to obliterate the veins in ordinary cases. (Mr. F. C. Skey, p. 178.)

Coagulating injections are more eligible and more certain than the external application of caustics. Of coagulating agents the perchloride of iron is very powerful, but, perhaps, the best is the iodo-tannin solution. (M. Desgranges, p. 178.)

AFFECTIONS OF THE RESPIRATORY ORGANS.

Colliquative Sweating.—Tannin dissolved in the aromatic sulphuric acid, or dilute sulphuric acid, forms a good combination in cases of colliquative sweating and chronic diarrhœa. (p. 388.)

Croup.—In true inflammatory attacks, you may depend upon the potassio-tartrate of antimony alone. For a child about a year old, you may give half a grain every half-hour, until full vomiting is excited and relief obtained; then a quarter of a grain every four hours so long as the difficulty of breathing and croupy sounds continue. (Dr. J. Elliotson, p. 38.)

Paracentesis Thoracis.—The best point for the operation is close on the upper edge of the sixth rib, midway between the sternum and spine. The chief danger is from the admission of air into the chest after the operation; this may be very much obviated by having an India-rubber apparatus fixed to the instrument, which, by its elasticity, sucks, as it were, the purulent secretion from the pleura, and at the same time allows the lung ample time to expand. (Mr. Stanley, p. 398.)

Phthisis.—We may often very materially soothe the passage to the grave by the cautious administration of small doses of opium. If the patient be anxious, restless, tossing about, and breathing very bad, &c., by giving a few drops of the liquor opii sedativus every ten minutes, the patient will become calm, tranquil, and will die quietly. (Dr. J. Bullar, p. 382.)

Pneumonia.—In the first stage of an attack in a healthy constitution, the capillaries of the lungs become distended, but they preserve their sthenic condition; in such a case, of course, you would bleed and give tartar emetic to act upon the whole vascular system. But if the capillaries have passed from this sthenic condition, or if from the state of the constitution, the type of the disease, or long-continued depressing influences, they have lost their sthenic power from the very commencement of the attack, then we have to deal with a contrary state of things, in which bleeding would be injurious and dangerous. You must meet these cases by large doses of quinine, five grains every three hours. Quinine appears to possess the same power in giving contractile action to the capillaries of the lungs which we know it possesses in so marked a degree over the capillaries and venous radicles in the spleen. The large proportion of venous capillaries in both the lungs and spleen seem to support this view. (Dr. Corrigan, p. 24.)

The value of the sulphate of quinine in this disease, when of a typhoid character, is not sufficiently known; it should be given early, and in large doses, say five grains every three hours. It is quite unnecessary that its use should be preceded by purgatives, emetics,

&c. It is difficult to say what is its mode of action, but we know that given in large doses it defibrinates the blood, rendering it fluid and incoagulable. (Dr. S. Gordon, p. 28.)

AFFECTIONS OF THE DIGESTIVE ORGANS.

Cancrum Oris.—This disease is generally preceded by some other malady, as measles, croup, &c., followed by bilious diarrhœa, which induces a state of the system where there is a deficiency of sulphur. The treatment must consist in the local application of a solution of the biborate of soda. The constitutional remedies are Fleming's tincture of aconite, six drops to two ounces of water ; a teaspoonful to be given every three hours. This will subdue the vascular excitement. The tincture of nux vomica must afterwards be given to stimulate the secreting vessels of the liver, and also sulphur to supply the deficiency of this element in the system. (Dr. J. Gray, p. 93.)

If you meet with the case before it has spread far, remove the slough with the knife, apply the strong solution of the nitrate of copper freely to the exposed surface, and paint the surrounding cheek with collodion. (Dr. C. Fleming, p. 95.)

Chronic Dysentery.—The compound tincture of benzoin is particularly useful in restoring the loss of function of the colon. Twenty drops may be given on sugar three times a day. (Mr. R. W. Ellis, p. 127.)

Cleft Palate.—When the cleft is extensive, it is better to divide the operation into two periods, so that the flaps may not be deprived of nourishment by the vessels which supply them being divided, therefore you must allow the collateral circulation in one half to be fully established before proceeding with the other. In a case where the cleft terminated in an angle anteriorly, but was three and a quarter inches separate posteriorly, it was determined to begin with the cleft in the hard parts. The soft parts covering the bones were separated by suitable knives, to an extent sufficient to allow of their edges overlapping in the mesial line ; the edges were then slightly pared, and three sutures loosely tied were inserted. These were removed on the fourth, seventh, and tenth days. The patient was allowed an abundance of fluid food for the first thirty-six hours ; after that he had soft food for three days, and on the fifth he ate some meat. The second portion of the operation was done about three months afterwards, and differed from Mr. Fergusson's, first, in having a short thread passed at the commencement through each portion of the uvula, so as to dispense with a forceps ; and second, in dividing the muscles from the front. If the cleft in the hard palate is not so extensive, it is better to operate on the soft parts

first. You should commence by passing a strong thread through each portion of the uvula, then divide the levator palati on each side; you should also divide the palato-pharyngei with the curved scissors, or they will draw the flaps backwards and outwards. If the flaps now lay fully in contact pare the edges and insert four sutures. You must remember that the position of the patient prevents the employment of chloroform from the risk of suffocation ; and as the operation is both painful and tedious, you must allow a free supply of wine both before and during the operation. To divide the interfering muscles the plan of Mr. Fergusson is perhaps the best in the hands of a thorough anatomist, but a trifling error might do serious mischief, for the carotid is at no great distance ; besides the point of the knife is liable to catch in the membrane of the pharynx, during its involuntary motions ; hence it would be best to use a slightly probe-pointed knife, by this means it will be impossible to get outside the pharynx and wound any important vessel. In cases where the soft parts are very scanty, dividing the muscles from the front, as Mr. Pollock recommends, and carrying the incision right through the soft parts, will greatly aid in approximating the edges of the fissure. The best kinds of sutures are waxed threads, flattened into a kind of ribbon, as less liable to cut through. A broad suture is especially necessary where union most frequently fails, at the junction of the hard and soft palate. The best mode of fastening the sutures is that described by Mr. Fergusson: one end of the suture is passed through a loop made by the other, and this slip-knot is pulled into the mouth, until the thread is sufficiently tight across the palate, and a common knot tied. (Dr. M. H. Collis, p. 180.)

English Cholera.—For severe attacks of vomiting and purging, so very common in autumn, there is no remedy so effectual in checking the disorder as pills composed of creasote and opium. (Dr. G. Budd, p. 86.)

Fistula-in-Ano.—The best injection for this consists of half-a drachm of the nitric oxide of mercury, and half an ounce each of mucilage and distilled water. (Mr. E. A. Lloyd, p. 218.)

To avoid the danger of wounding the finger, when penetrating the bowel with the bistoury, introduce a glass-plated speculum, having an incisura half-an-inch wide, and extending two and a-half inches from the orifice of the instrument into the bowel. Cut down upon this along a director with a sharp-pointed bistoury. (Mr. A. Ball, p. 218.)

Gastric Juice, *Deficient Secretion of.*—Take care that the albuminoid food be as liquid as possible ; let the quantity requisite for the day's consumption be taken at frequent short intervals ; and if likely to turn sour, guard it with alkalies. We often find a draught of cold water an hour or two after meals, will remove the discomfort arising from difficult solution of meat meals; in part by replacing

the gastric juice, and also by favouring the absorption of the delayed nutrimentary mass. In the way of medicines, a pill containing a grain of ipecacuanha, or of capsicum, with three grains of rhubarb, may be taken before dinner. For slowness of digestion ipecacuanha is more effectual than any of the other stimulants. When digestion is habitually slow and feeble, much lasting benefit will be derived from the nitro-muriatic acid, taken half an hour before the principal meals. (Drs. Budd and Chambers, pp. 83, 84.)

Excessive Secretion of.—Bismuth, combined with aromatics or alkalies, may be administered before meals with advantage. When there are fœtid eructations, you may give creasote pills (containing from a quarter to half-a-minim) or a few grains of bisulphite of soda; or some finely powdered wood charcoal. To alleviate pain, and allay general nervous irritability, the best medicines probably are conium and belladonna, which do not confine the bowels or check the secretions as opium does. (Dr. G. Budd, p. 82.)

Habitual Constipation.—In obstinate cases of this kind you will find the following a very capital pill: Half-a-drachm of extract of henbane, one scruple of extract of colocynth, and three grains of extract of nux vomica, made into twelve pills, one to be taken night and morning. (Mr. J. H. Houghton, p. 127.)

Hard Palate, *Fissure of.*—Where a small opening is left after disease, carefully remove the edges, so that they may overlap each other; on each side make an incision one inch in length down to the bone, and about half an inch external to the fissure, then bring the flaps together with the quilled suture; you must now carefully dry the parts, and wash them over with a solution of gutta percha in chloroform, to prevent the mucus from the nose being drawn between the flaps, and preventing adhesion. (Mr. A. G. Field, p. 186.)

Hemorrhoids, *Internal.*—When they are florid, granular, and do not project much above the surrounding mucous membrane, the application of nitric acid is the best mode of treating them; but if they are large, pendulous, or indurated, the ligature ought to be used; it is entirely free from danger if properly done. (Mr. T. J. Ashton, p. 210.)

Ligature of.—You must first empty the bowels by an enema, then seize the tumours with a forceps and draw them down; pass a double ligature through the base of the tumour, tie thoroughly tight in two portions, and return them within the rectum. You may give half-a-drachm of laudanum immediately afterwards. Some surgeons include them in a single ligature; but this should not be done excepting they have a very narrow peduncle; the ligature is much more likely to slip, and you cannot draw it so tight. (Mr. T. J. Ashton, p. 214.)

The treatment of intenal hemorrrhoids should be, 1st, To remove the whole of the enlargements within the sphincter by ligatures; 2nd, Each tumour should be transfixed by a double ligature; 3rd, The ligatures should be tied as tight as possible; 4th, Enlargements exterior to the sphincter should be removed with the scissors. (Prof. Syme, p. 221.)

Hepatic Dropsy.—If there be pain in the right hypochondrium, a few ounces of blood may be taken, and followed by the application of a blister. Evacuate the intestines by a freely acting purgative, and repeat this once or twice a week. Having done this you must bring the system gradually under the influence of mercury; to do this you may give pil. hydrarg. gr. iv. with pulv. scillæ gr. i., night and morning, and rub on the abdomen the lin. hydrarg. twice a day. You may place dependence on this treatment, but it will be necessary to sustain the mercurial action for several weeks. Diuretics may be employed freely, if careful analysis assure you the urine is free from albumen. The best diuretics are the salts of potash, combined with spt. æth. nit. and spt. juniper. co. If these have not a very sensible effect in diminishing the ascites in the course of three or four weeks, you must at once have recourse to tapping, before the internal organs become interfered with in their functions by pressure. Lastly, you must give dry nutritious food, with a small amount of some stimulus; as patients of this kind have generally been intemperate they will not bear low diet. (Dr. G. Burrows, p. 134.)

Hernia.—It is a point of considerable interest whether it is best to open the sac or not. We should say that whenever the strangulation is recent, and no adhesions of the sac to the tendinous aperture through which it has escaped have been formed, it ought not to be done, as the dangers which may arise from opening the peritoneal cavity are thus avoided. But if the hernia has been strangulated for some days, and structural changes have occurred, it is better always to open the sac, and examine the protruded viscera. (p. 196.)

When the omental protrusion is of old standing, thickened by deposit, or condensed by pressure, it should be left in the sac, in the hope that it may be agglutinated to the neck of the sac, and thus form a barrier against the re-descent of the hernia. Lawrence thinks there is no advantage in this, but experience proves that it either gradually recedes or becomes atrophied. If the omentum be in a state of gangrene, the devitalized part must be entirely removed by a clean incision, and every bleeding vessel separately tied; it may then be returned, one end of each ligature being brought through the wound. (Mr. A. Baker, p. 198.)

In all cases nothing is more important than the necessity of operating early. In femoral hernia the danger of delay is of peculiar

importance, for three-fourths of the cases which refuse to rally after operation are of this kind. Femoral hernia is much less frequent than inguinal, but much more frequently requires operation. With regard to the question of opening or not opening the sac, experience decidedly tends towards the latter operation, although more by negative than positive evidence. It may be asked, what are the conditions of intestine when its return would not be advantageous? There is only one condition when such practice can be deemed advisable, and that is where the bowel is decidedly ruptured. When gangrenous only, the neck of the sac has been shown to be its right position, but when ruptured, leave it in its place, return any unaffected bowel, if present, but leave the ruptured portion. (Mr T. Bryant, p. 188.)

If you do not succeed with the taxis give a full opiate and try again in four or six hours; you will often find it will then be easily returned. (Dr. S. Nicolls, p. 204.)

Expiratory Method of Reduction.—The peculiarity of this plan is, that just before the taxis is applied the patient is directed to make a very full expiration, and to refrain as long as possible from making a fresh inspiration. While this is going on the practitioner attempts to return the hernia, continuing his efforts gently but steadily, during the whole period of suspended respiration; when the patient is compelled to draw a fresh breath, the pressure should be somewhat relaxed, and the expiration again repeated and continued as long as may be required. It acts by disassociating the diaphragm from the abdominal muscles; and by preventing them acting in concert, it prevents the patient from pressing down and resisting the efforts made to reduce the hernia. (Dr. A. Buchanan, p. 205.)

New Mode of Reducing.—The patient must be laid upon the back, with the pelvis much higher than the shoulders. The extremity of the index finger must then be passed through the ring between the viscera and the hernial orifice (this procedure will demand great perseverance), the finger must then be hooked, and sufficient traction exerted on the ring to rupture some of the fibres, giving rise to a crackling sensation. If this does not take place, the fibres must be submitted to a continuous forced extension, which by distending them beyond their natural elasticity, generally terminates the strangulation. Considerable strength and exertion will sometimes be required, but the ring is enlarged just as if had been divided by a cutting instrument, or it will be largely dilated, and reduction easily take place by performing the taxis. (Baron Seutin, p. 207.)

Indigestion of Drunkards.—The most efficient remedies are bitters, opium, and solid food. Gentian, quassia, and calumba, may be taken singly or combined, in the form of tincture, an hour before the principal meals; with these small doses of opium or morphia may

be advantageously combined, to tranquillize the nervous system, but in all these cases it is essential that the patient should eat as soon as possible some solid nourishing food. (Dr. G. Budd, p. 86.)

Intestinal Worms.—For round and thread worms (to a child two years old), give three grains of crystallized santonine, and about two hours after it a dose of calomel and jalap; in the course of twelve or twenty-four hours the worms will be expelled. Santonine is a medicine which may be given with perfect safety, and its effects are certain and satisfactory. (Mr. G. G. Perry, p. 130.)

Mouth, *Congelation in Operations on.*—It will be very difficult to produce the required benumbing effect, except with great care. It is necessary that the cold be applied equally and with some pressure. It is much better to enclose the freezing mixture in a thin India-rubber bag, to prevent the ingredients escaping and irritating the mouth. It will also be necessary repeatedly to change or mix the fluid so as to maintain the desired cold. (Mr. J. R. Quinton, p. 179.)

Prolapsus Ani.—When the integuments around the anus are relaxed and thickened, remove the redundant folds of skin by repeated applications of the scissors, not in a circular direction, but pointed from the circumference towards the centre of the orifice. The horizontal position must afterwards be strictly maintained, and the bowels kept quiet for some days. By the contraction which will take place in the treating of the wounds the bowel will be retained. (Prof. Syme, p. 219.)

Pyrosis.—The classes of remedies which have been found most useful are astringents and sedatives. We might advantageously combine five grains of bismuth with a twelfth of the grain of the muriate of morphia; or five grains of the compound kino powder, or logwood, catechu, krameria, with opium, given two or three times daily before meals. (Dr. G. Budd, p. 86.)

Stomatitis.—The chlorate of potash possesses a peculiar influence over all inflammatory and ulcerative affections of the mouth. Although these disorders may be dissimilar as to cause, nature, degree, tissue affected, and common only in being situate in the mouth, they are all equally amenable to its control. For infants of one year five grains is an ordinary dose, for an adult a scruple or half a drachm. If the disease be acute you may push it further by giving it more frequently; if it be carried too far it will excite purging, but if given in smaller doses disappointment will only ensue. If properly administered its virtues and potency are indubitable. (Mr. J. Hutchinson, p. 108.)

Follicular Stomatitis.—When the tongue, lips, gums, &c., are covered with numerous round aphthous excoriations, the effects of chlorate of potash are little less than wonderful. For a child two or three years old, you should give six grains three times a day in simple solution. (p. 98.)

Ulcerated Stomatitis.—In a very severe case, in a child seven years old, twenty grains of chlorate of potash were ordered in bark three times a-day; the ulcers in a few days were clean and healthy, and were healing very nicely, when a relapse took place; the chlorate was increased to thirty grains three times a-day, which was borne without any inconvenience, and in a few days the mouth was again quite well. (Mr. J. Hutchinson, p. 98.)

Sympathetic Vomiting.—The most effectual remedies for this are, sedatives, to lessen the irritation from which it springs; alkalies, to neutralize the acid which the stomach contains; astringents, to restrain the undue and untimely secretion. The insoluble antacids, magnesia and chalk, are very suitable; bismuth has a remarkable effect in restraining undue secretion, especially when combined with magnesia or chalk. If there are any symptoms indicating inflammatory action, apply a blister to the epigastrium, and attend carefully to the diet, which should consist chiefly of milk and farinaceous food. (Dr. G. Budd, p. 82.)

Syncope Senilis.—Gastric irritation from the food remaining undigested in the stomach, appears to be the sole cause of the attack; this gives rise to syncope and convulsions which may be fatal. Vomiting at an early period is the most effectual remedy. Half a drachm of the powder of ipecacuanha, with ten or fifteen grains of bicarbonate of potash to neutralize any acidity, will produce full vomiting and raise the system to its normal condition. The nausea and ineffectual natural attempts at vomiting produce debility and exhaustion. If the first half drachm of ipecacuanha does not operate, a second dose may be given with perfect safety. In advanced age the body does not require the same amount of solid food. It has been erroneously said that "wine is the milk of old age," the truth is that milk is the wine of old age; second childhood should be treated as directed by the late Dr. James Hamilton, of Edinburgh, "Plenty of milk, plenty of flannel, and plenty of rest." (Mr. J. Higginbottom, p. 124.)

Tape-worm.—The following mode of administration of male fern is recommended. You must first prepare the patient by clearing out the bowels and keeping on low diet. For an adult give two calomel and colocynth pills at night, and a dose of castor oil in the morning; when the bowels have acted well give one drachm and a half of the oil of male-fern on some aromatic water, and repeat in six hours if necessary. The dose of the oil must be the same for a child as an adult. No unpleasant results ever follow its use. (Dr. W. Jenner, p. 133.)

Tonics, *Vegetable and Mineral.*—Quinine and the bitters generally do much good in persons exhausted by over-work, hard drinking, or other causes; they improve the appetite and strengthen digestion.

The best time for giving them is about half-an-hour or an hour before meals. The different bitters have not precisely the same effect; calumba has a sedative influence not possessed by others; gentian and chiretta tend to increase the secretion of the liver; quinine and quassia seem to impede its secretion. Tonics do harm in organic diseases of the stomach, in plethoric states of the system, and generally where there is a furred tongue, or when the urine throws down a sediment of the lithates. When there is any disposition to sickness or nausea, the ammonio-citrate of iron, in conjunction with the bicarbonate of soda or potash is the most pleasant preparation, and will have the same effect as Griffith's mixture. The sulphate of iron, like other metallic sulphates, has a tendency to cause sickness. Steel medicines act generally, instead of locally, and are therefore best given at meal times, so as to be absorbed with the food. (Dr. G. Budd, p. 87.)

Ulcer of the Stomach.—If there be a constant gnawing pain at the epigastrium, apply some counter-irritant, as a blister, mustard poultice, &c.; if the powers are exhausted, dry cupping is the best means of mitigating it. A still more valuable remedy, in some cases of obstinate vomiting and severe pain, may be found in frequently swallowing small bits of pure ice. In cases of severe hemorrhage its use is almost indispensable. When severe pain is accompanied by very frequent vomiting, a very small opium pill is retained better than any other sedative. If diarrhœa be present the compound kino powder, combined with the trisnitrate of bismuth is an excellent remedy. Ten to twenty grains of the trisnitrate of bismuth, with five to ten grains of the compound kino powder, has a very remarkable effect in relieving pain, vomiting, and diarrhœa. If flatulence be very troublesome the alkaline carbonates with bitter infusion are the best remedies. We can recommend the following combination: potass. iodid. gr. i.; potass. bicarb. gr. xv.; tinct. aurant. ℥ss.; inf. calumb. ℥viiss. To be taken an hour after food. (Dr. W. Brinton, pp. 80, 116.)

AFFECTIONS OF THE URINARY ORGANS.

Albuminuria.—In that form which occurs after scarlet fever, it will generally disappear by the rigid adherence to a milk diet; if this should not suffice, urea given in doses of one-third of a grain, occasions an abundant secretion of urine and rapid disappearance of the dropsy. (M. Mauthner, p. 152.)

Diabetes.—*Opium* has a most powerful effect in diminishing the quantity of urine, but does not cure the disease. *Ammonia* in some cases has the power of reducing the urine, the specific gravity, and the quantity of sugar. *Cod liver oil* improves the general condition of the patient, and reduces the urine. The combined

use of cod-liver oil, opium, and ammonia, effects the most prompt and permanent benefit. *Blisters* to the hepatic region are useful. A *mixed generous diet* is the best; restriction is rather baneful than beneficial. (Dr. J. Bell, p. 144.)

Lithotomy.—The staff must be kept well up in the angle of the pubes, and, at the same time, made to project into the perinæum. One incision through the integuments and another through the muscles of the perinæum should be sufficient before entering the groove of the staff. Be careful to commence the incision of the urethra sufficiently low, lest you cut the artery of the bulb. Use a curved staff, with a long beak, so that the knife runs only in the straight part, not on the convex part. When you have divided the membranous part freely, depress the handle of the staff with the left hand, and, at the same time, press forward the knife; if the opening be not sufficiently large you may enlarge it on withdrawing the knife, or by afterwards passing in the index finger and moving it about; then introduce the forceps on the finger, from below upwards, and remove the stone. (Prof. Colles, p. 221.)

Phymosis.—Take a long slightly-curved needle, with its point guarded by a bit of wax; introduce this at the orifice of the prepuce, carry it back as far as possible, and thrust it through the foreskin, with this raise and draw forwards the prepuce, apply a forceps between the needle and the glans, and excise with one stroke of the bistoury. The cut edges of the skin and mucous membrane exactly correspond, and must be accurately brought together and secured with fine silk sutures. (Mr. T. B. Curling, p. 222.)

Tightly stuff the cavity between the prepuce and the glans with fine charpie. By cutting upon this the skin and mucous membrane are divided on the same plane, and without any danger to the glans. (M. Bonnafont, p. 223.)

Stricture of the Urethra.—The knife ought never to be employed in any case when you can introduce the thread catgut bougie, that is, in any stricture which is pervious. When you can once introduce a bougie into the bladder you can cure that stricture without cutting it. There is not one case in two hundred, of even bad strictures, where the knife need be used at all. Mechanical means must be combined with medical treatment; if you cannot pass a bougie, give one grain of the iodide of mercury three times a-day to promote absorption, and the buchu mixture to relieve irritation. To pass the bougie as far as the stricture, and allow it to remain half an hour with gentle pressure, will excite the absorbents. If you can pass a fine catgut bougie, pass over it a No. 5 elastic tube, and withdraw the bougie. As a general rule, the bougie should be passed every other day for the first week or fortnight, afterwards the periods to be lengthened to once a week, then once a fortnight, but the use of the instrument must never be abandoned altogether. (Mr. S. Solly, p. 224.)

When there is repeated retention of urine, it will be necessary to open the membranous portion of the urethra behind the stricture. To do this it is necessary to hit off, with microscopic accuracy, the delicate line of the raphé, for if we cut sideways through the muscles the wound will be found to gape, there will be hemorrhage and extravasation of urine. This operation is much more easy and successful than puncturing the bladder through the rectum, for, while the recent wound is healing the previous stricture will be found to give way very much, so that an instrument may be readily passed. (Mr. Lane, p. 247.)

Syme's Operation for.—There can hardly be any serious hemorrhage in urethrotomy by external incision, unless the artery of the bulb has been wounded, which may certainly be avoided by cutting in the middle line upon a grooved director. Extravasation of urine may take place if the stricture be not freely divided, or, still worse, if the stricture be undivided and the urethra opened behind it. The urethra should be freely exposed before opening it, so that the incision of its coats may not be subcellular, which would expose the patient to the same dangers which attend internal incision. There can be no safety unless a free drain be provided for the urine through a full-sized catheter; this will require very careful management, the external extremity should be curved downwards, so that the urine may fall into a vessel without wetting the bedclothes; stopcocks are productive of much danger, the person in charge gets confounded, so as not to know whether the catheter is open or shut, and if the patient makes any expulsive efforts he may do himself much injury. It will be much better to keep the catheter constantly open, so that the urine may not pass along its outer surface. The patient should remain quiet on his back, with a pillow under his knees for forty-eight hours, no change of position being allowed. It is not desirable that the wound should heal by the first intention; if there be any tendency to this, the finger must be occasionally introduced so as to feel the instrument, or the patient will be exposed to a relapse of the disease, Strictures do not occur behind the bulb, except in cases of extreme rarity, so that incisions into the membranous portion of the canal are unwarrantable. The danger of extravasation will be especially serious when the deep fascia of the perinæum has been divided; in such cases the introduction of a straight tube, as after lithotomy, will effectually prevent the risk of serious consequences. (Prof. Syme, p. 244.)

In Syme's operation for stricture, one element essential to its success has by many been entirely overlooked, and that is, the necessity of passing a full-sized bougie at intervals, gradually increasing, and for a considerable time after the cicatrization of the opening made in the urethra. In the treatment of stricture of the urethra great advantage will be gained by passing a No. 8 catheter as far

as possible, and keeping its point pressing with moderate firmness against the obstruction for twelve or twenty-four hours; systematic attempts should then be made to overcome the impediment, first, with the No. 8, and then, if necessary, others of smaller calibre. This is a powerful adjunct to the ordinary mode of treatment with the bougie, and should be employed in certain cases, which may be be classified as follows:—1. Those in which the contracted portion is longer than usual. 2. Those which afford but little time for treatment. 3. Those which are likely to resist the passage of an instrument for a considerable time. 4. Those which would yield if the patient would rest, but when he cannot. (Dr. J. Wallace, p. 227.)

Urinary Fistulæ.—If the opening be small, and situated in front of the scrotum, you will often succeed in closing it by the application of strong nitric acid to the edge of the fistulous orifice and upon the skin around it, even when the hare-lip operation has failed. It may be applied several times in the course of several months. Nitrate of silver, or strong tincture of cantharides, have been successfully employed in the same manner. The tincture of cantharides may be applied three or four times in twenty-hours; the loose cuticle should then be scraped out and the tincture again applied; this must be occasionally repeated, until the granulations appear healthy and bid fair to close the aperture. (p. 239.)

Dieffenbach's method of treating these fistulous openings, when small, was, to pass a large catheter into the bladder, to revive the edges of the opening, to detach the skin from the subjacent structures for half an inch in every direction, and to bring the free borders together in the median line by means of the twisted suture. This done, two incisions were made, one on each side, to relieve tension. This plan he afterwards modified by dissecting beneath the skin from the outlying lines of incision towards the fistulous opening, so as to convert the part into a bridge, which might avoid contact with the urine which escaped along the course of the catheter. Success cannot be expected if the fistulous opening be more than one-third of an inch in any direction. M. Nelaton prefers to make the outlying incisions about an inch above and below the opening, which is supposed to afford a better chance for the urine to escape. Again, he has proposed not to close the opening by sutures at all, but to allow it to contract by itself. (Dr. H. Thompson, p. 241.)

AFFECTIONS OF THE SKIN, ETC.

Condyloma.—In the removal of large condylomatous growths, where the peduncle is broad, it will be better to pass two double ligatures through the neck, so as to include a smaller portion in each ligature, and to avoid the risk of hemorrhage from the ligatures slipping.

When the growths are large or numerous, the lithotomy position will be found much the most convenient for securing the vessels. (Mr. W. D. Husband, p. 216.)

Deformities from Burns.—The chief attention ought to be paid to these cases just at the time when they are most usually withdrawn from treatment; it is then that splints, bandages, and other mechanical contrivances should be resorted to and rigidly persevered with, in order to preserve the part or limb in its natural position. Operations for the relief of these contractions generally fail, because the surgeon's attention has been directed more to the cicatrix itself than the newly-formed structure underneath, which is really the active agent in the production of the contraction. (Mr. F. Rynd. p. 287.)

Eczema Infantile.—*For diminution*, you may give one grain of calomel with a little white sugar to the youngest infant; when older give it in such a dose as will produce an efficient relief to the alimentary canal; this may be repeated once, twice, or three times a week, but generally once is sufficient. *To alleviate the local distress*, apply freely night and morning the benzoated oxyde of zinc ointment over the whole of the inflamed skin; this should be allowed to remain as a permanent coating until the skin is entirely healed; it will prevent the formation of crusts by the exclusion of atmospheric air. It is very important not to disturb the ointment, but at the same time it must not be allowed to accumulate too thickly. Washing is quite unnecessary, indeed it is injurious and must be avoided. In chronic eczema infantile, that is, pityriasis capitis, the nitric oxyde and nitrate of mercury ointment of various strengths are almost specifics. For the *restoration of power* the great remedy is arsenic,, as an effective harmless tonic it stands alone and without its peer in this vexatious disease; indeed it is specific, it cures rapidly, perfectly, and unfailingly. Two minims of Fowler's solution may be given three times a day to an infant from two months to a year old. It is very useful combined with iron as follows: ℞. Vini ferri, syrup. tolutan. āā ʒss.; liq. potassæ arsenitis ℥xxxij; aquæ anethi ʒi. M. Give one drachm three times a day after meals; if it appears to disagree it should be given less frequently or suspended. Cod-liver oil in conjunction with arsenic is a valuable addition. The following formula will be found convenient: ℞. Olei jecoris aselli ʒij.; vitelli ovi j.; liq. potassæ arsenitis ℥lxiv.; syrupi simplicis ℥ij; aquæ fontan. q. s. ad ʒiv. M. ft. mist. A drachm three times a day. (Mr. E. Wilson, p. 271.)

Fetid Perspiration from the Feet.—This will generally be relieved by washing the feet night and morning in salt and water, and afterwards applying a little olive oil. (B. W. Richardson, Esq.)

The best effect will be produced by bathing the feet every night in a strong solution of subcarbonate of soda. (R. C. B., *Med. Times*, July 19, 1856, p. 64.)

Impetigo and Eczema.—Keep the parts moist with lint saturated with a solution of half-a-drachm of carbonate of soda to one pint of water, covering this with oil-silk. For *Favus* first remove the crusts by poulticing, then apply oil to exclude the atmosphere and prevent the growth of the parasitic fungi. These remedies should be conjoined with cod-liver oil and generous diet. (Dr. J. H. Bennett, p. 269.)

Itch, *Cured in half-an-hour.*—Sulphur applied in a liquid form is more readily absorbed, and consequently more certainly destructive to the insect than when used in the form of ointment. To prepare a solution, boil one part of quick lime with two parts of sublimed sulphur in two parts of water, until dissolved. The body should be previously washed with warm water, and then this solution rubbed in for half an hour. By this time the cure will be complete, and it will only be necessary to wash and use clean clothes. (Dr. Bourguignon, p. 266.)

A much more speedy and cleanly method of treating this loathsome disease than the filthy proceeding of inunction, is to wash the parts affected with a solution of the sulphuret of calcium for half an hour night and morning. It is rarely that a third application is necessary, but it should be enforced to make security doubly sure. (Mr. W. B. Kesteven, p. 266.)

Scrofula, Anæmia, Boils.—Liquor cinchonæ hydriodatus cum ferri is a very valuable preparation of iodine. It may be given in doses varying from fifteen minims to two drachms. It does not produce the evil effects which arise from small doses of the other preparations of iodine. Another new preparation, the liquor cinchonæ hydriodatus, in doses varying from one to three drachms, is equally valuable in secondary syphilis when the usual treatment has failed. (Mr. J. C. Christophers, p. 299.)

Ulcers of the Leg.—We must endeavour to preserve the purulent secretion which nature has provided as a protective covering; if this be deficient, the best ointment as a substitute will be one composed of two parts of lard and three of chalk, mixed when heated and fluid; this must be applied spread on linen, and over this a flannel or calico bandage. If the ulcer be extensive and the discharge great, it should be dressed every day, but generally ulcerated legs are disturbed much too frequently; all interference should be postponed as long as possible. One great advantage of the chalk ointment is that it neutralizes the acrid secretion, and allows the dressing to remain much longer than otherwise, without interfering with the healing process. When removing the dressing be careful that you do not take away the ointment which may adhere to the ulcer, or you will very much hinder its healing. (p. 276.)

General principles of treatment often require some modification in practice. The instances in which the chalky incrustation and

compression has answered best are superficial ulcerations, however extensive the surface, and whether dependent on varix or not. Deep and callous ulcers require a special treatment, which is best fulfilled by the addition of a stimulant to the chalk ointment, and the best is, the nitric oxide of mercury; ointments of tar and chalk, and iodine and chalk, are found to subdue many forms of irritable ulceration. Dr. Hughes Bennett and others confirm the value of tar in all dermal affections of a psoriasical character. The use of bandaging is of equal importance, to afford a support to the veins. Poultices are generally injurious, and cannot be condemned in too emphatic terms; they relax and weaken the structures and granulations, which rather require tonics and support. The application of a poultice is nothing less than a mischievous interference with the natural healing process. Lotions of every kind are equally prejudicial. The constant application of cold water is exceedingly injurious. To keep patients in bed is a useful element in the treatment of varicose ulcers of the leg, but compression answers every object to be gained by the assumption of the recumbent position; and whenever compression is resorted to, exercise confers the direct and positive benefit of assisting and sustaining those processes necessary for restoration, it sets up an additional energy in the process of reparation by its direct effects as a stimulus. Of the various measures which have been proposed for the treatment of varicose ulcers of the leg, we may notice Mr. Syme's proposal for blistering the edges of the callous ulcer. Mr. Holt has proposed the exclusion of atmospheric air by the application of plaster, oiled silk, and collodion. M. Denonvilliers has recently brought glycerine into notice as a clean and useful application to ulcers. Dr. Neumann is an advocate for the application of charcoal. Mr. Gay maintains that the edge of the ulcer is not free to contract, being bound down to the tissues beneath, and therefore recommends an incision to be made through the healthy skin and superficial fascia, within a short distance of the edge of the ulcer, in a direction parallel to the direction of the axis of the limb. Mr. Chapman adopts a modification of this, but considers the cases very rare where it would be required. To Mr. Hainsworth is due the credit of reviving the ancient practice of excising the margin of the callous ulcer. The late Dr. Golding Bird and Mr. Spencer Wells have explained and illustrated the application of the electric moxa. Mr. Skey advocates the use of opium upon principles which are unquestionably authentic and sound. (Mr. J. K. Spender, p. 282.)

The most important point is to get rid of the superincumbent column of blood which impedes the circulation; this is best done by means of a flannel bandage, from seven to eight yards long and three inches wide, applied very carefully, so as to give complete and uniform support to the affected limb. In indolent ulcers the compound tincture of iodine is the most safe and efficient stimulant. In irritable ulcers, the application of the following lotion—iodide of potas-

sium, one scruple; hydrocyanic acid (Scheele's) half-a-drachm; camphor mixture, one oz.—applied for four or five minutes with lint well saturated acts like a charm. The following ointment may be afterwards employed: spermaceti ointment, half an ounce: iodine, five grains; extract of belladonna, one drachm. (Mr. T. Westlake, p. 269.)

URTICARIA.—This is generally caused by the imperfect digestion of particular articles of food, such as crabs, mussels, pork-pie, fish honey, mushrooms, cucumbers, almonds, and oatmeal. Our main object of treatment must therefore be to expel the offending matter as soon as possible; this is best done by an emetic, followed by a warm quick purgative. If it seems rather to be referable to several articles in common use, it may be kept off by the administration of a few grains of rhubarb before dinner; it may occur from weak digestion, attended with general debility: in such cases the carbonate of ammonia, with the tincture of gentian, will succeed when other means fail. To allay the cutaneous irritation use a lotion composed of half a drachm of acetate of lead, half an ounce of tincture of opium and half a pound of water. (Dr. G. Budd, p. 268.)

AFFECTIONS OF THE BONES, JOINTS, &c.

AMPUTATION, *after Injuries.*—The main artery of a limb may be suddenly obliterated, or the chief nerve be rent asunder without danger to the vitality of the limb. But if the muscles at the seat of the injury are very much contused, and the collateral channels for arterial as well as venous blood, are involved in the injury, it is more than probable that the limb will fail in nourishment, the indication of which is the loss of its temperature. Several hours, or even a day, may be required to determine the affirmative on this evidence. To justify amputation from muscular injury, this must be very great, and the investing integuments not capable of replacement. Undue importance has been attached to exposure of the cavity of a joint and fractures into joints, although these must always be considered as serious complications; yet they often recover with good motion. (Mr. F. C. Skey, p. 154.)

At the Knee Joint.—The obtaining of a longer and firmer stump than in amputation where part of the bone is removed, is in itself no small advantage. The rectus, with its point of insertion remaining entire, is a matter of vast importance to the power of progression. The non-interference with the medullary cavity obviates many of the dangers of amputation, while the extremity of the femur being retained and largely supplied with vessels, there will not be so much danger of exfoliation, as if the dense structure of the bone were divided. There is little fear but that the flaps will adhere over the cartilaginous extremity of the bone. Of the many ways of performing this operation, none appear so good as the old one of Hain. (Dr. G. H. B. Macleod, p. 162.)

Dislocation of Femur.—On looking at the limb from the side, the front outline of the thigh will present a concavity, instead of the curved prominence natural to it. (Mr. Wormald, p. 169.)

Another most useful diagnostic sign is the loss of support from behind to the femoral vessels. On pressing them with the finger, there appears a hollow behind them, and a deficiency of that firm support which they naturally possess. (Mr. J. Hilton, p. 169.)

The patient must be laid on the back and chloroformed. Then place the front of the knee of the affected limb in your axilla, and pass the right hand under the thigh from within outwards. With the left hand grasp firmly the upper part of the displaced bone, at the same time taking the left wrist in the right hand, you must now bind the thigh on the pelvis and rotate outwards. By this the head will generally slip into the socket. (Mr. T. Wormald, p. 168.)

Dislocation of Humerus, (*old standing*).—You must first place the patient under the *full* influence of chloroform. You may dispense with the counter-extending girth around the chest, if you only fix the scapula. This may be done by a strong bandage placed like a soldier's belt across the shoulder, and meeting behind. This, by using strong force against the upper border of the scapula, at once fixes it. By careful manipulations and extensions, the head of the bone must now be directed to the glenoid cavity. (Mr. T. Wormald, p. 170.)

Elbow-Joint, *Severe Injuries of*.—Primary amputation ought never to be thought of in compound fracture of the elbow, excepting the artery be torn through, or the soft parts both before and behind hopelessly damaged. The ill consequences to be feared are in inverse proportion to the amount of external laceration inflicted. In cases sufficiently severe to warrant it, it is far better surgery to freely enlarge the wound behind the joint, and excise the projecting ends of the bones, than to be content with a simple reduction. In treating these cases poultices and warm fomentations should be utterly eschewed. When it is determined to save the arm, you must do so in spite of discouraging circumstances which may afterwards occur. (Mr. J. Hutchinson, p. 164.)

Excision of the Os Calcis.—The first incision must be begun where the calcaneum, astragalus, scaphoid, and cuboid bones meet, and carried in the direction of the calcaneo-cuboid articulation outwards across the dorsum of the foot, a finger's breadth behind the projection of the fifth metatarsal bone, and directly inwards across the sole of the foot, as far as a line drawn from the fourth toe. A second incision must be commenced where the first terminated, nearly at right angles to it, and carried backwards so as to terminate on the inner side of the tendo Achilles, an inch above its insertion. This flap must be turned back, keeping the knife close to

the bone, excepting where crossed by the peroneal tendons. The tendo Achilles must now be divided, and the knife carried through the articulation of the calcaneum with the astragalus, then the calcaneo-cuboid joint must be laid open, and the bone will be found pretty moveable, but it must not be torn away, neither must other parts be used as a fulcrum to prize it out; the connections must be cut. The greatest difficulty is in separating its deep connections, which cannot be seen, and scarcely felt, the bone being in the way. You must take care to keep the knife close to the bone, so as to avoid wounding the posterior tibial artery and nerve. (Mr. R. W. Coe, p. 166.)

Scott's Plaster.—Nothing is more useful than this, with rest, in many affections of the joints. It is composed of equal parts of ung. hydrarg. and cerat. sapon., with camphor. It should be spread on slips of lint, and applied round the joint, some inches both above and below. Over this you must apply strips of soap plaster in the same way, and over all a bandage steeped in gum and chalk. (p. 399.)

Wounds of Joints.—To excise the elbow-joint, because a compound fracture of the olecranon had been sustained, would of course not be warrantable, as it may heal and unite without the occurrence of inflammation; but if articular inflammation do take place, the question does admit of serious consideration whether it would not be best to excise the ends of the bones, with the hopes of saving the patient's constitution, and of gaining a mobile joint. (Med. Times, p. 157.)

VENEREAL AFFECTIONS.

Bubo.—This is the stoppage place of a certain amount of infectious matter from a sore, part of which excites suppuration around the gland, and is thus got rid off, while another part is absorbed into the system, and produces secondary eruptions, &c. You may remove this poison by puncture with a grooved needle, before it arrives at maturity, or affects the system. By puncturing the bubo three times a month, large quantities of fluid will be discharged and suppuration prevented. (Mr. South, p. 294.)

Common Sore, or Venerola.—There are three stages through which we may trace this sore: the first is ulcerative, the pimple which comes out on the third or fourth day increases until it is about the size of a pea; in the second stage, the sore throws up a border or elevated edge, granulations also spring up to the edge of the mound; in the third stage, these granulations are absorbed and cicatrize. This is the ulcer of gonorrhœa inoculation, and is never followed by secondary symptoms. Mind, now, that about these sores there is, no thickening, tumefaction, induration. Indurated

sores, that is with edges like cartilages, are very rare indeed. If your patient has true syphilis bubo, you feel a distinct gland inflamed under your finger. It is not like common bubo, but inflamed tissue like an abscess, running along the line of Poupart's ligament. There is no suppurative action in true bubo. None of these common complications are at all bettered by mercury. The chief and abiding principle of treatment in venerola is, to keep the parts scrupulously clean. The sore will take a certain time to heal, and you cannot stop the ulcerative process either by mercury or caustics. Above all things the parts must be kept clean, or your patient will have a "crop of sores." Simple spermaceti ointment and morphia is the nicest application. In the second stage give bark or quinine, and an extra allowance of good wine. At the end of four months you may look out for secondary symptoms, but you will never find them. In this special sore, which produces no sore throat, no eruptions, &c., mercury is never required. In fact mercury is not more required for what are called syphilitic diseases, than for any other class of diseases. Mercury, as regards syphilis, is the greatest curse of a cure, and about the most useless thing as a remedy ever discovered. (Mr. F. C. Skey, p. 290.)

Gonorrhœa.—The injection of the balsam of copaiba is much more efficacious than when given in the usual way. The following formula may be adopted:—copaiba five drachms; one yolk of egg; extract of opium one grain; water, seven ounces. (Mr. Dallas, p. 307.)

The infusion of buchu is quite as efficacious in gonorrhœa as balsam of copaiba, and is not so objectionable on account of its smell or disagreeable taste. (Dr. H. Hancox, p, 307.)

Gonorrhœal Epididymitis.—Cold applied to the scrotum by compresses dipped in water is a powerful remedy, assuaging pain, preventing further effusion, and expediting absorption; if it induces an uneasy sensation the temperature must be raised from cold to cool, and continued until the cure is complete. Conjointly with this the patient should take a saline purgative at intervals. (Prof. Sigmund, p. 308.)

Mercurial Fumigations.—A very simple and effectual plan is to have the patient seated on a caned chair, underneath this you must have a spirit lamp so placed that the flame impinges on a thin metallic plate, which contains the mercury to be volatilized; this may be from one to three drachms of calomel for each fumigation, or if the patient inhale the mercury according to Mr. Lee's practice, fifteen grains will be sufficient. The chair and patient must be closely surrounded with a blanket. (Dr. J. Green, p. 305.)

Rapid Mercurialization.—Pass ten or fifteen grains of the ung. hyd. fort. within the sphincter ani three times a day, and in twenty-four or thirty-six hours ptyalism will be established. The patient must be carefully watched lest it run too far. (Dr. S. Nicolls, p. 384.)

Mercurial Ptyalism.—The chlorate of potash is a very valuable remedy, and may be given in doses of ten grains three times a day. If these doses do not relieve, it may be safely increased to one drachm. M. Herpin, of Geneva, was the first to use it in cases of severe salivation. (Mr. J. Hutchinson, p. 98.)

Obstinate Chancre.—*Opium* acts most efficaciously in those cases in which mercury is of the least use, and vice versâ. Thus in constitutional syphilis it acts as a mere corrective, and should only be given in very small doses. When, however, the chancre manifests any tendency to phagedæna, mercury should be rigidly forbidden, while opium is especially valuable in diminishing the irritability, pain, and suppuration. It is in the phagedænic serpiginous ulcers that large doses of opium act almost as a specific. It should not be given too frequently, for if the stomach be kept too constantly under its action digestion will be interfered with; the entire daily quantity should be taken at two doses, morning and evening. Wine should also be given freely with the opium as a corrective to the stomach; to prevent its constipating effect on the bowels, and to obviate the tendency to sleep. (M. Rodet, p. 296.)

AFFECTIONS OF THE EYE AND EAR.

Cornea Affections.—*Chronic thickening of the epithelium of the cornea* may depend upon a hypertrophied state of the palpebral conjunctiva, rubbing against the front of the cornea; for this you must rub freely the inside of the lid with a smooth piece of the sulphate of copper, and, at the same time, apply the ointment of the red oxide of mercury. A collyrium, composed of four grains of the sulphate of alum, or zinc, with half a drachm of the sedative solution of opium to one ounce of water, is also very useful. *Ulceration of the cornea* readily yields to one or two touches of the solid nitrate of silver, and the internal administration of one or two purgative doses of rhubarb and carbonate of soda, combined with some tonic. When the ulceration extends deeper, it presents an even surface on its bottom, with a sharp well-defined edge. The best remedies for this are tonics, both locally and generally. Apply daily, or every second day, the nitrate of silver, by impregnating the fine point of a camel-hair pencil with a saturated solution of the salt, and then gently touching the ulcerated surface with it; give Dover's powder with calomel at night, and Peruvian bark with carbonate of soda during the day. The preparations of iron are sometimes very valuable. The nitrate of silver does not act as an irritant as many suppose, but as a direct sedative, allaying the irritability of the part. If the ulceration pass through the anterior elastic lamina opacity will remain, which will be best removed by the bichloride of mercury. In *purulent and gonorrhœal inflammations*, the nitrate is all-powerful in arresting their destructive tendency. In *inflamma-*

tion of the conjunctival corneal layer, named "*pannus*," local and general tonics perseveringly employed, along with small doses of the bichloride of mercury, will remove the disease. In very bad cases, destroy the enlarged vessels supplying the part by nipping up small portions of conjunctiva all round the cornea, and passing a very fine ligature round, tying each, and cutting them off very close. If the penetrating ulcer be situated near the centre of the cornea, the treatment must be quite different; drop a solution of sulphate of atropia (six grains to the ounce of water) upon the conjunctiva, and smear extract of belladonna upon the eye-brows; after twenty minutes, endeavour with a fine probe to free the margin of the iris from the aperture, and then touch the ulcer with a fine point of solid nitrate of silver. In *inflammation of a strumous character*, the cornea quite suddenly becomes milky in hue; this opacity is evidently in the lamellated structure, and must be treated by applying four or six leeches to the eye every second day, to stop *in limine* the morbific action. Give mercury, so as to gently affect the system, combined with Dover's powder, or the tartrate of antimony with quina. When the acute stage has passed, give the iodide of potassium, and tonic doses of the bichloride of mercury. When all inflammatory action has disappeared apply the ointment of the red oxide of mercury every night, and, during the day, drop a solution of the iodide of potassium (ten to twenty grains to one ounce of water), into the eye for some weeks; it will remove the olive-coloured stain produced by the long-continued use of nitrate of silver. The preparations of iron and iodine are the best tonics for internal exhibition. Mercury, in minute doses, is an active and very safe tonic; it is certainly very efficacious in removing the opacity of structure which remains after the acute stage has passed by. If the posterior elastic lamina be inflamed, mercury should be given, so as rapidly and certainly to affect the system, combined with tartar-emetic and opium, but mercury is *the* essential remedy. Extract of belladonna, applied over the eye-brows, is of no small importance in allaying any irritation which exists, and in keeping the pupil dilated. (Mr. S. Browne, p. 248.)

Epidemic Purulent Ophthalmia.—In the first place, remove the patient to a healthy, airy ward. If you see the case early, you may generally check it by dropping into the eye every hour one part of liq. plumbi diacet., one of vinum opii, and two of distilled water. A solution of nitrate of silver, four grains to the ounce, may be used in the same way, but the former is to be preferred; if the upper lid be much swollen, this will not arrest its progress, and instead you must apply a few leeches repeatedly, at short intervals, and also scarify the lower lid daily. The bowels must be freely opened by sulphate of magnesia. The eyes must be cleared of the adhering discharge, with small pieces of old linen, which must be thrown away immediately. Sponges are never allowed. Mercury

should never be used during the acute stage, and, perhaps, it would be better entirely excluded from the treatment. When the vascular tension subsides, the eyes must be syringed frequently with a weak solution of alum, which must be gradually used stronger. If the lining membrane of the upper lid remain granular, its surface must be brushed over with a solution containing three grains each of the sulphate of zinc and sulphate of copper, six grains of sulphate of alum, and one ounce of water. (Dr. F. Kirkpatrick, p. 260.)

Strabismus.—*Sub-conjunctival Operation.*—This was first practised by M. Guérin, in France. In 1843 it was repeated by Mr. Charles Brooke; it afterwards was neglected and condemned, until recently it has been again brought into notice. The operation may be thus performed:—The eyelids must be kept apart with the spring speculum; draw the eye from its unnatural position, make a small incision with a probe-pointed pair of scissors down to the sclerotic, three or four lines internal to the cornea, and horizontal with its lower border, through this aperture pass the knife beneath the muscle, turn its back to the sclerotic, and, with a gentle sawing motion, the muscle will be heard to give way. A particular knife will be required, with the blade bent at an angle with the handle, to facilitate its introduction. (Mr. C. Holthouse, p. 262.)

Which Eye to Operate upon.—In alternating squint, when both eyes appear to be affected, the comparative visual power of the two eyes is the only test that can be depended upon. We may lay it down as a law, the less the difference in the visual power of the two eyes, the greater the tendency of the squint to alternate, and, conversely, the greater the difference, the less the tendency to shift. The rule of practice, must, therefore, be, to select that eye for operation, the visual power of which is inferior to the other; but when the power of the two eyes is alike, it is immaterial which you choose. (Mr. C. Holthouse, p. 264.)

Vascular Erectile Tumours.—The perchloride of iron, kept constantly applied by means of a pledget of lint dipped into it, exercises a coagulating power over the blood of vascular tumours, sufficient to effect a cure if persevered in for some time. (M. Leclerc, p. 265.)

MIDWIFERY AND THE DISEASES OF WOMEN.

Encysted Placenta, that is, where the placenta is retained by the contraction of the os uteri after parturition, must be removed by gently dilating the os first by the placenta itself, if possible, or if this do not succeed, by the fingers, drawing gently at the cord, and at the same time having firm pressure made on the abdomen. (Dr. Tyler Smith, p. 336.)

Ergot of Wheat.—The medical and obstetrical property of this ergot is as incontestable as that of ergot of rye; its effects are as prompt, as direct, and as great. Its hæmostatic action appears equally certain. (Dr. Jobert, p. 354.)

Hysteric Hemiplegia.—This may be known from hemiplegia depending on disease of the thalamus opticus and corpus striatum by its occurring generally in young subjects, by the muscles of the face not being affected, and by loss of sensation preponderating over loss of motion. The best treatment is steel and valerian. (Mr. F. C. Skey, p. 18.

Inversio Uteri.—Immediate steps must be taken to reduce it; first the uterus must be reduced as far as possible by pressure, then by moderate but sustained force it is to be passed up through the vagina and os uteri. It is reinstated with a sudden jerk, causing a considerable report at the moment. (Dr. Tyler Smith, p. 335.)

Milk, *To arrest the Secretion of.*—Smear the extract of belladonna on the areola of the breasts. Nothing can have a more pleasing effect than it generally has in relieving the pain and arresting threatening abscess. (Dr. R. H. Goolden, p. 354.)

Ovarian Cysts, *Injection of.*—After the evacuation of the ovarian fluid, a No. 16 prostate catheter should be passed nearly its whole length through the canula; the end of the catheter must then be screwed to the stop-cock nozzle of a large gum-elastic bottle, containing two ounces of the Edinbro' tincture of iodine; this must be injected with as much force as possible, so as thoroughly to wash the cystic parietes. A compress and bandage must be afterwards applied. Stimulants freely exhibited both during and after the operation reduce the remedial risk to its minimum. (Dr. C. Edwards, p. 345.)

Placenta Prævia.—The chief methods of treatment are—1. The plug. 2. Puncturing the membranes. 3. Turning the child. Plugging is adapted to those cases which occur at the sixth or seventh month, when a continuous drain is going on after the first loss. The best method of plugging is to introduce strips of lint, pieces of sponge, or a silk handkerchief dipped in vinegar and water. Do not plug too tightly, or uterine contraction may be excited, and further separation take place. Puncturing the membranes is adapted for those cases, not very severe, where the os uteri is only dilated to a slight extent, and turning is impracticable; it arrests the hemorrhage by lessening the vascular supply, and bringing down the presenting part of the child to act as a plug to the placental site. Turning is the grand remedy in placenta prævia, if performed at the proper time it affords the greatest chance of safety to both mother and child. (Dr. Tyler Smith, p. 312.

The most prompt and efficient method in almost all cases is to

introduce the hand, dilate the os uteri, separate the intermediate portion of placenta, rupture the membranes, seize one foot, turn, and deliver. In selecting the time when to do this, the great thing is to distinguish the dilatable character of the os uteri; if this be present the extent of dilatation is of no importance comparatively. It requires great care that the dilating force be steadily applied and evenly distributed, so as to guard the cervix from laceration, which might prove fatal from hemorrhage. Version is sometimes prohibited by the immediate exhaustion of hemorrhage, or from rigidity of the os uteri, in spite of hemorrhage; in the former case plug and give stimulants freely, as a temporary resource. In the latter case separate the entire connection of the placenta, rupture the membranes, and excite uterine action. (Dr. H. Oldham, p. 310.)

Post-Partum Hemorrhage.—In cases where women have suffered from flooding in several previous labours, you should give one or two doses of ergot during the last pains which expel the child. Immediately after delivery, in suspicious cases, the hand should be placed on the abdomen, and pressure made until efficient contraction is felt to take place. The uterus should be grasped and held firmly by the hands. The application of cold to the vulva and abdomen, by douching with a wet towel, or dashing the water on, is very effectual in rousing the uterus to contraction. If these means fail, the hand should be washed and introduced into the uterus. In addition to this, if the uterus appear paralyzed, cold water may be injected in a full stream into its cavity, or galvanism may be tried if there be time and convenience. Cold and heat applied alternately are much more efficacious than cold applied alone to excite reflex action. When one reflex surface is exhausted you may appeal to another, dashing cold water on the face, swallowing a gulp of cold water, an enema to the rectum, &c. Whenever coagula collects in the uterus or vagina, they produce irritation, keep up the hemorrhage, and must be turned out with the hand. If the placenta be only partly separated, or remain in the uterus, it must be immediately removed; if the patient be very much reduced do not wait, pour some brandy down her throat, and proceed at once. (Dr. Tyler Smith, p. 323.)

Premature Labour, *Induction of*.—Pass an œsophagus tube some distance into the uterus, to separate the chorion around the os; this plan is much superior to rupturing the membranes, and much simpler than the douche. (Dr. Copeman, p. 344.)

Procidentia Uteri.—A piece of mucous membrane of a horse-shoe shape, about three-quarters of an inch wide, must be cut from the posterior and inner lips of the vagina, the anterior edge of which must be on a line with the meatus urinarius. Two deep quilled sutures must then be introduced, and when the parts are brought together the edges must be united by the interrupted suture. The

essential points in the operation are, to divide the sphincter, pass the quilled sutures deep, give opium freely, use generous diet, and pass the catheter frequently. (Mr. I. B. Brown, p. 339.)

Puerperal Convulsions.—After the more common remedies have failed. the administration of turpentine conjoined with castor oil by the mouth has been found very efficacious. (Dr. R. T. Woodhouse, p. 327.)

Ruptured Perineum.—In the Vienna Lying-in-Hospital, Vidal's serres-fines seems to have superseded every other means of approximation. It may be necessary to pare the edges a little; then, as soon as the bleeding has ceased, two or three may be applied according to the extent of laceration. Allow them to remain two hours, keep the parts clean, and, above all, keep the patient on her side till the termination of the case. (Dr. W. Wilson, p. 141.)

It is possible for these cases, although very severe, to terminate favourably without operation. To render every assistance, you must keep the knees bound together, pass the catheter several times a-day, and lock up the bowels with chalk mixture and opium. (Mr. A. Taylor, p. 342.)

Suspended Animation.—A very convenient and useful instrument for inflating the lungs of newly-born infants, is a vulcanized india-rubber ball, about the size of an orange, to which is attached a German-silver tube, five inches long, slightly curved at the end, with two eyes like a female catheter. This must be introduced into the larynx, and by compressing the ball, the air will rush into the lungs: on removing pressure, it becomes instantly refilled with air, but to prevent it being the same which has been into the lungs, there must be a hole in the tube near to its connection with the ball, to admit fresh air. This opening must be guarded by the finger during compression. (Dr. J. G. Wilson, p. 347.)

Uterine Affections.—Carbonic acid gas applied as a local anæsthetic, may be very successfully used in neuralgia of the uterus and vagina, and in various morbid states of the pelvic organs, accompanied with pain and spasm. It may be very conveniently generated in a common wine bottle, by mixing six drachms of crystallized tartaric acid with a solution of eight drachms of bicarbonate of soda, in six or seven ounces of water. A long flexible caoutchouc tube tightly fixed to the cork, conducts the gas from the bottle into the vagina. (Prof. Simpson, p. 249.)

Uterine Neuralgia.—This is often conjoined with uterine deviations, and may be alleviated or removed by sedative injections into the bowels,—say from fifteen to thirty minims of Battley's solution, with a drachm of tincture of henbane in a teacupful of warm milk. No remedy is so valuable in neuralgia as heat, (cauterization with a red-hot iron), but as this is so very objectionable, apply to the most painful part a hammer previously plunged in boiling water. (Dr. E. J. Tilt, p. 332.)

Uterine Tents.—Elm bark possesses many advantages over sponge for dilating the cervix uteri. It is less expansible, and so dilates more gradually: it is not decomposed, and furnishes an abundant mucilage, which protects irritated or diseased surfaces. (Dr. H. R. Storer, p. 343.)

Vaginal Plug.—The common vulcanized india-rubber air ball, about the size of a large orange, makes an admirable and easily-adapted plug. If fastened to one end of a metallic tube, furnished with a stop-cock at the other end, when the air is pressed out and the tap turned, it may be very readily introduced into the upper part of the vagina; air may then be admitted by turning the tap, or, if necessary, cold water may be injected into it. (Mr. W. F. Cleveland, p. 327.)

Vaginitis.—A composition, consisting of eighty parts of glycerine and twenty of tannin, has been found of great service. Copious injections of warm water should be previously used, and the part freed from mucus, &c. by lint; then a plug should be introduced saturated with this composition, and allowed to remain to the next day. (M. Demarquay, p. 354.)

MISCELLANEA.

Arsenic, *New Mode of Testing for.*—This electro-chemical method consists essentially in depositing the arsenic in a metallic state upon a surface of platinum, by touching the spot with a thin slip of zinc. To prepare the solution for testing, muriatic acid must be previously added, and the liquid afterwards concentrated by boiling; after concentration more muriatic acid must be added. (Dr. Davy, p. 422.)

Caustic Gutta Percha.—By mixing two parts of chloride of zinc with one of powdered gutta percha, in a tube over a spirit-lamp, a very useful and flexible caustic will be formed. (M. Richard, p. 389.)

Frozen Persons, *Treatment of.*—Immerse the body immediately in cold water, containing a large quantity of ice. (p. 377.)

Ingrowing Toe Nail.—With a fine and well tempered file let the *patient* make a vertical incision from the matrix to the free edge of the nail; thus prepared, you must seize the smaller section with a pair of dissecting forceps, and with slight tractile and jerking force tear it away. (Mr. J. B. Gallway, p. 399.)

Scrape the nail moderately thin with a piece of glass, apply freely the solid nitrate of silver, then put a poultice on; in a few hours, if the nail be not quite loose, apply it again. In a day or two the nail will be separated, and may be removed without the least pain. (Mr. C. Lovegrove, p. 400.)

Lead Poisoning.—When we have loss of power of the superior extremities, with corresponding loss of substance, without diminished sensation, if there be no evidence of cerebral mischief, we should suspect lead as the cause of the disease. The term paralysis should be restricted to those cases which have their origin in the brain or

spinal cord ; in lead atrophy the loss of power is dependent on loss of muscular substance, and differs from true paralysis in being gradual instead of sudden in its invasion. The treatment should consist of warm baths, electricity, and frictions. (Dr. J. Tunstall, p. 419.)

Leeches, *Revival of.*—As soon as the leeches come off, they should be submerged in a mixture consisting of one part of vinegar and eight of water; they immediately begin to disgorge, and must then be pressed gently towards the mouth between the thumb and finger. After disgorgement the leech must be washed twice in common water, and then placed in an earthen vessel with plenty of water, and kept at a uniform temperature. The water must be changed every morning, and the dead leeches cast out. In four or five days the leeches will bite and draw as much as before. (p. 397.)

Strychnia, *Tests for.*—One part of bichromate of potash dissolved in fourteen parts of water, to which two parts of sulphuric acid are afterwards added, is the most delicate and certain test for strychnia. When added to a suspected solution. if strychnia be present, it will be precipitated in the form of a beautiful golden-coloured insoluble chromate. The crystals are immediately formed. A single half grain of strychnia. although divided into millions of atoms of crystals each. will demonstrate the presence of strychnia as well as if a pound weight of it were operated upon. (Mr. J. Horsley, p. 437.)

The physiological test is the most reliable ; if 1-8000th of a grain be injected into the thoracic cavity of a frog, it will become tetanic in ten or fifteen minutes. In order to apply any of the tests, we must first have the strychnia in a pure state. Suppose an animal has been poisoned with the smallest possible quantity, take the blood from the heart and large vessels, mix it with twice its bulk of water, coagulate by boiling, acidify with acetic acid, decolorize by filtering through crystals of sulphate of soda or animal charcoal, concentrate the filtrate, add potash to precipitate the strychnia, purify and apply the tests. Strychnia seems to produce death by destroying muscular irritability and rendering the tissues unable to absorb oxygen, and exhale carbonic acid. (Dr. G. Harley, p. 426.)

To do away with all possible sources of fallacy from the action of external re-agents, you must put a little strychnia, with sulphuric acid. on a piece of platinum foil, and then connect the foil with the positive pole of a single cell of a Grove's or Smee's battery, and, by touching the acid with the negative pole terminating in a piece of platinum wire, the characteristic violet colour is instantly produced. In operating on the contents of the stomach, acidify them with acetic acid, dilute if necessary with water, and filter; evaporate this on a water-bath to the consistence of a thin paste, add eight or ten times its bulk of cold alcohol, filter and distil so that the spirit may not be lost. The residue, after the evaporation of all the spirit, must be diluted with water, filtered again, and super-saturated with liq. potassæ. Shake this with its own bulk of ether, and allow the two solutions to separate, decant the clear etherial solution,

and treat the aqueous residue with a fresh quantity of ether, and so a third time, if necessary. The etherial solution must be distilled to remove the ether, and the residue dissolved out of the retort with a small quantity of diluted acetic acid and filtered; treat again with potash and ether, and after the spontaneous evaporation of the ether, the alkaloid will be sufficiently pure to be identified. (Dr. H. Letheby, p. 445.)

Strychnia and Woorali.—These two poisons have the effect of reciprocally neutralizing the action of each other, according as the one or the other is in excess. Frogs poisoned with woorali, when flaccid and insensible, very soon become tetanic if strychnia be injected; and, on the other hand, if poisoned with strychnia and afterwards punctured with woorali, the tetanus speedily disappears. When treated in this way they will recover from a larger dose of each, than would be sufficient to destroy life if either were given alone. Thus it would appear that the one might be used as an andidote for the other. (Dr. G. Harley, p. 430.)

The Ecraseur.—This new instrument consists essentially of a chain ligature and a constricting apparatus, by means of which it may be progressively tightened. It has been most successfully and extensively used in the removal of hemorrhoidal tumours. A strong ligature is first put round the base of the tumour: this done, the chain is applied, and made to cut its way through by gradually tightening. If the tumour completely surround the anus, an instrument, composed of six hooked branches, is introduced into the extremity of the bowel, the crotchets expand at pleasure and stick into the tumour, by which it can be well brought down, and the ligature and chain applied as before. A considerable tumour may be removed in ten or fifteen minutes, with very slight loss of blood. It has been employed for the removal of cancerous affections of the tongue, by making a small incision in the mesial line under the chin, and introducing the instrument through this. Amputation of the neck of the uterus and removal of uterine polypi have been performed with the ecraseur; also amputation of the penis, circumcision, operation for the radical cure of varicocele, &c. &c. The ecraseur is greatly superior to the ligature, its action is more rapid, the pain less, there is less inflammation, less suppuration, less risk; the wound heals rapidly, and there is an immunity from many dangers attending wounds, so says its inventor, but we have reasons to doubt that this is always the case. In operations involving the whole circumference of the anus there will be danger of occlusion if a pledget of lint be not introduced into the intestine, or there may be danger of stricture afterwards from contraction of the cicatrix; these objections should make us hesitate to employ the ecraseur for the removal of tumours encircling the anus. In many respects it is superior to the ligature, and for the removal of vascular tumours is superior to the knife, but it will never supersede either to any extent. (Dr. R. Kirkwood, p. 400.)

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PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

Art. 1—ON THE CAUSE OF EARLY DANGEROUS SYMPTOMS IN FEBRILE DISEASES.

By Dr. William J. Cummins, Physician to the Cork Dispensary.

[In all contagious fevers, we occasionally meet with examples of so malignant a character, that the vital powers are at once overwhelmed, and the victims are hurried to the grave with appalling rapidity. Now it is remarkable, that from whatever source the poison has been derived, the earliest symptom it produces is a general congestion, or more or less complete stagnation of blood in the capillaries throughout the entire system. We must look for something as the cause of this congestion: to do this, we need not trace the physiological causes of capillary circulation, it is sufficient for our purpose to allude to the powers which regulate the calibre of the vessels. It is the sympathetic system of nerves which imparts tone to these little vessels; when it ceases to preside over them, they become dilated, the circulation is retarded, and congestion is the result. This is easily proved, both by experiment and by diseases. When the sympathetic connection is divided or paralysed, in a limb, we have a local congestive fever in the part. With such facts as these before us, Dr. Cummins says]

It is impossible to doubt that epidemic and contagious poisons, whether received directly from without, or indirectly through a diseased condition of the fluid from which the system demands nutriment, produce congestion through the medium of the sympathetic nervous system. Hence, it would appear that the sequence of events in each is the following:—

A. *In contagious or blood fevers.*—1st. The poison causes changes in the blood, and the change produced varies according to the nature of the poison, whether it be the variolous, the scarlatina, the typhus, &c.

2nd. The *diseased* blood being applied to the sympathetic nervous system, in common with the other textures of the body, causes disordered functions of that portion of the economy.

3rd. The capillaries being under the control of the sympathetic nerve, lose their tone, become dilated, and the circulation through them retarded, giving rise to general congestion.

B. *In non-contagious or purely nervous fevers such as yellow fever, remittent and intermittent, &c.*—1st. The epidemic poison, however applied, poisons the sympathetic nervous system, rendering it unequal to the performance of its functions.

2nd. Congestion results; thus, we find that, in blood diseases, the congestion is a tertiary, and, in epidemic non-contagious diseases, it is a secondary lesion.

There are, of course, other effects besides congestion produced by the disordered function of the sympathetic nerve, as well as by the disease of the blood, such as suppressed or altered secretions, delirium, &c.; and the congestion itself must result before long in disease of the blood, even when that lesion has not been primary; but I do not wish to enter into these matters, as I am at present treating merely of those rapidly fatal cases of disease, in which congestion, though co-existent with other pathological conditions, is the most marked and dangerous phenomenon of the case.

In practice, we meet with various degrees of malignancy, even amongst these unusually malignant cases. The most aggravated I have seen occurred in the person of a gentleman of intemperate habits, who was placed under arrest for drunkenness during the prevalence of yellow fever on board ship. On the third or fourth day of his confinement, I happened to see him chatting and laughing gaily in his cabin about 8 o'clock in the evening. Shortly after, he was attacked quite suddenly with pain in the head and back, followed by collapse, with a pulse full and excessively rapid, but, at the same time, scarcely communicating an impulse to the finger placed upon it, and easily obliterated by the slightest pressure. His skin was dark, his eyes bloodshot, and the mucous membrane of the tongue and fauces dark red. In a short time the overloaded capillaries of the stomach and intestines poured out black vomit (blood) copiously, which was discharged by stool and vomiting; he never rallied, and was a corpse shortly after midnight.

A case which I believe to have been somewhat similar to this occurred in this city a few months since, but unfortunately I did not see it, and can only allude to it as it was described to me by the mother. A girl, aged 18, whose brothers and sisters were ill in scarlatina, was attending to her duties, apparently well, the afternoon of the day she was taken ill. Towards evening she complained of sore throat and slight headache. She rapidly became worse, and died the next morning, with symptoms of great prostration.

Dr. Hare informed me that he has met with more than one instance of the same kind during the late severe visitation of scarlatina in this city. Such cases as these are the result of "those pestilential vapours and poisonous exhalations which make their way to the very penetra-

lia of the body, inducing death almost before disordered action can be said to have set in;" and in many cases, as I have already hinted, I think it probable that they make their way to the penetralia of the body, "to operate upon the more subtle constituents of animal natures" otherwise than through the medium of the circulation, for the "modifications." "attractions," "repulsions" and "other attributes of magnetic and electric agencies," have a special, though little understood influence on the nervous system; and some, at least, of the mysterious epidemic poisons which produce such rapid death, must have a connexion with these, and probably, also, with similar undiscovered agencies. This being the case, we can well understand how an epidemic poison operates upon the nervous system without the intervention of the blood, for electricity and its analogies certainly have a far more intimate connexion with the nervous system than with the blood.

The remedies for these malignant congestive fevers are powerful stimulants of all kinds; but there is one therapeutic agent belonging to this class upon which I rely far more than upon any other, because I conceive that it has a special action upon the sympathetic system; I mean quina in large doses. But this medicine is, of course, far more useful in fevers of the purely nervous class than in those where the blood is primarily diseased. In the one, as we should expect, it is capable of *cutting short* the disease; in the other, it is merely calculated to neutralize the tendency of the diseased blood to produce disordered functions of the sympathetic nerve, and thus keep the patient alive until the diseased blood has been thrown out of the system by crisis.—*Dublin Quarterly Journal, Aug.* 1856, *p.* 45.

2.—CONSIDERATIONS RESPECTING THE OPERATION OF MALARIA ON THE HUMAN BODY.

By Dr. C. Handfield Jones, F.R.S., Assistant Physician to St. Mary's Hospital.

[Malaria is a frequent cause of disease which is better appreciated in other countries than in our own. What it may be in itself, we know not, whether it be a chemical compound, a peculiar electrical state, or an allotropic form of common matter; but we may say, that it is distinct from the causes of typhus, typhoid, or the exanthemata. We shall first draw attention to some important points in its history, and then consider the diseases which it produces.]

1. The almost universal prevalence of malaria throughout the temperate and tropical regions of the globe, is a circumstance, it appears to me, of the most striking import. Go almost where we will, to the fairest and brightest spots on the surface of the earth, the same evidence of the pronounced doom ever appears. Still it is found to be the case, "that cursed is the ground for thy sake." What is the country in Europe that is exempt from this scourge? As far north

as Sweden it prevails; and the farther we proceed south the more intense and deadly does the poisonous influence become. From all the shores of the Mediterranean, we have accounts of its existence; and in Sicily, one of its islands, a non-medical authority has specified particularly no less than eighty-two unhealthy situations. It was probably one of these that a British commanding officer three or four times attempted to occupy as a telegraph post, and did not desist, though warned by the natives of the consequences, until thirty men were successively destroyed by the unseen foe. Of the tertian fevers of Minorca, Cleghorn has written; and of the extermination of their garrisons at St. Fiorenzo, in Corsica, French authorities can tell. In Algeria, the same malaria is met with, as abundantly witnessed by MM. Boudin, Maillot, and Laveran. To attempt any further detail of the places where malaria has been found by sad experience to prevail, would engage me in almost endless quotations and references, and is perfectly needless. We all know by even popular report of the fevers of the East and West Indies, the coast of Africa, North and South America, Burmah and China; and the dependence of these on malarious influence is as well ascertained as anything possibly can be. Now, one cannot but conclude from what has been stated, that the conditions which give rise to malaria must be exceedingly common ones; and that it cannot be regarded as a miasm capable of being evolved only in a few special localities.

2. It is an established fact, that the presence of vegetable matter is by no means necessary for the production of malarious disease. Ample proof of this is cited by Dr. Watson in his 'Lectures,' and by Mr. Martin in his work on 'Tropical Climates.' The former adopts the plain conclusion, that, "for producing malaria, it appears to be requisite that there should be a surface capable of absorbing moisture, and that this surface should be flooded and soaked with water, and then dried; and the higher the temperature, and the quicker the drying process, the more plentiful and the more virulent (more virulent, probably because more plentiful) is the poison that is evolved." And again: "There is reason to believe that the flooding of a porous earthy surface with water, and the subsequent drying of that surface under a certain degree of heat, constitute the sole or main conditions of the generation of the poison." Mr. Martin is inclined to attribute the malaria-generating property of soils to their containing a quantity of iron ore. He has obtained evidence showing that, at all the most unhealthy stations on the west coast of Africa, the earth and the mud of the rivers was invariably ferruginous. Similarly in the slave States of North America, it is mentioned by Mr. Featherstonehaugh that malaria is found in continual connexion with the ferruginous soil of those countries, with the red sandstone rock, and the red mud of the Arkansas. Now, must we not really feel that these statements respecting the non-essentiality of vegetable decay to the production of malaria are of the very widest and gravest import? If it be indeed

so that the mere rapid evaporation of water from a soil that has been saturated is adequate to generate a deadly poison, where shall we undertake to say that this may not happen? Even should it be necessary that the soil should be ferruginous, how very common still would be the conditions capable of producing malaria! Some fragments of medical experience seem to point, however, nearly in the same direction. Dr. A. T. Thomson recommends that the floor of a sick room should be swept—never washed. "An invalid may as well sleep in a swamp as in a room the floor of which is frequently washed." Dr. Alison has observed the frequent occurrence of croup on Saturday night, the only day in the week on which it is customary for the lower orders in Edinburgh to wash their houses. These and like experiences may be worth bearing in mind in attempting to form to ourselves a theory of malaria. The production of dysentery by malaria, which no one doubts, and of croup by the vapour from a drying surface, are not things very dissimilar.

3. There seems good reason to believe that a very brief exposure to malarious emanations is sufficient to affect the system, at least when the poisonous influence is very intense. Dr. McCulloch states that he has frequently observed that fever may be induced within half an hour after exposure to malaria, and that a single inspiration, or the space of a very few seconds, is amply sufficient for the purpose. His experience, he affirms, is corroborated by that of many practised and acute French and Italian physicians. They record instances of labourers dying instantaneously from merely sitting or lying down on the ground, and of others who, from looking into a ditch or drain, have been struck dead by the poison which, of course in a minor degree, would have merely produced a fever. Lind also describes, as well as many others, an instant seizure with nausea and delirium.

4. It is certain that a person may be exposed to malarious emanations, and yet suffer none of the usual effects until some considerable time, weeks or months after, when some special exciting cause comes into operation, as the setting in of an east wind, exposure to cold and wet, great fatigue. Nay, the malaria may fail to affect the system at all in the absence of these exciting causes, when otherwise it is morally certain that it would have. I must quote a very interesting fact in proof of this from Dr. Copland:—"Between twenty and thirty persons were exposed all night without cover to the air of one of the most fatal sources of miasmata furnished by a warm climate, during the unhealthy season, but were soon afterwards removed to sea, far from any further exposure to this specific cause. They continued well for six or seven days, when about half their number experienced great fatigue. All these were nearly simultaneously—on the following day—seized with remittent fever; while those who had not been subjected to the consecutive cause, with the exception of two, who were not attacked till several days subsequently, entirely escaped, although all had been equally exposed to the specific cause of that form of fever." I have

now a young female under my care with tertian ague, who lived with her family at Wisbeach, in Cambridgeshire, till she was about fourteen. Since then she has been living in London, but has not had any ague till the present attack, which is five years from the time of her change of residence. It seems reasonable to suppose that the debilitating influences of a town life have brought the original infection into play by impairing the vital resistance. Her father had ague when a lad, was then free for a number of years, and healthy. After he came to London, he continued free for four years, but was then attacked by quotidian.

5. When very intense, the action of malaria on the system is most deadly, prostrating organic life, just as in the worst forms of malignant cholera. This is what has been termed *febris algida*, the patients never attaining to reaction after the deadly stroke, but dying in the cold stage. In some of these cases, the peril is from a special affection of the heart; but, in the majority, the prostration involves the whole nervous system.

There are numerous forms of disease which are capable of being produced by malaria. Omitting any further mention of fevers, graduating, according to the intensity of the cause and the degree of predisposition, from intermittents into continued, we may notice dysentery and neuralgia as being as much modes of manifestation of malarious action as fevers. The almost constant supervention of dysentery on remittent fever is so well known that to adduce evidence would be merely tedious. Dr. McCulloch alludes to the not uncommon occurrence of a fit of neuralgia and a paroxysm of intermittent happening on alternate days, reminding us of the double tertian. The case has been mentioned to me by one of the members of this Society of an officer, aged 23, who having returned from Africa in ill health, had an attack of ague on Friday and on the following Sunday. On the next Tuesday, the day for the paroxysm, he had instead severe neuralgia of both forearms, continuing from the evening to the next morning. After this, the ague paroxysms recurred again. Dr. Copland, whose world-wide experience makes his testimony especially valuable, recognises malaria as one of the most efficient causes of neuralgia. The same authority sustains also the opinion that rheumatism may result from malarious influence. I believe I have witnessed the same occurrence myself. That *pestilential cholera* is a malarious disease, closely allied to the pernicious fevers, I am fully convinced, following the opinions of Bell, Dixon, Billing, and others. While cholera was epidemic in London in 1854, I had a severe attack of an aguish character; and the peculiar depression I then experienced continued for some weeks, until the disease passed away. I could only shake it off by going to Hampstead, where I immediately regained a degree of vigour, but lost it again as soon as I returned to Paddington. From that period to the present, I may say that aguish disorder and neuralgic affections have been prevalent to a degree that

I never knew before. *Apoplectic* and *paralytic* affections are known to occur as the results of the poisonous influence we are considering; and I believe these morbid phenomena are of much significance in attempting to form an opinion respecting the general action of malaria. While I do not doubt that local determination of blood may have some effect in causing the impairment of the function of the nervous structure, yet I think there is much ground for believing that both nerves and nervous centres suffer primarily by the operation of malaria, sometimes in a way of irritation, but chiefly by enfeebling and debility. Slighter cases show this even more certainly than severer ones. In 'The Lancet,' for October 20th, I have recorded two cases which appeared to be ordinary neuralgic affections of the upper extremities, peculiar only in this, that the motor nerves of the muscles were involved to a considerable extent, and not only the sensory. Here there could be no question of any congestion of the encephalon. A naval surgeon, a robust strong man, engaged at the Crimea, and especially in the Kertch expedition, got diarrhœa, and, soon after, paralysis of one arm came on, which lasted about a day, and then disappeared. An assistant-surgeon, who had been at Balaklava since the commencement of the war, was seized there with fever, and remained there till convalescent. He was invalided to return home, and on reaching Constantinople went on shore to make a few purchases. He over-fatigued himself, and on his return on board was seized with paralysis of all his extremities, the intellect remaining perfectly clear. He arrived in England in this perfectly helpless state, unable to feed himself, or do anything for himself. In about two or three months he recovered perfectly. The cases of two members of our profession have been mentioned to me, who, after suffering remittent fever in the Crimea, became to a great degree idiotic. One of them imagined he had two bodies, and if any one sat near him, was fidgeted lest his second body should not have room enough. The other thought he had two heads. Another gentleman, who suffered also from fever in the Crimea, and was very much prostrated both bodily and mentally when he returned home invalided, regained his bodily health very well after some months, but was far from having the same mental energy that he used; he could not apply himself with attention to anything, and could not use the same muscular exertion as before. In these cases, one cannot but recognise a special state of cerebral debility, or impairment of its functional power, quite apart from all suspicion of congestion. I must adduce the following instances from Dr. McCulloch, on account of the great importance of the point. In a situation exposed to malaria, and never free from its diseases, while the other members of a large family had the intermittent under different but ordinary forms, two were attacked with paralytic affections suddenly; the one in the leg and thigh, the other in the arm. I viewed these palsies as modes of the apoplexy of intermittent; and the judgment was confirmed by the

almost spontaneous disappearance of the disease in both, and the immediate establishment of the regular quotidian. The apoplectic state is not limited either to the first attack or to the acuter forms of these fevers, although in Italy that appears to be the most common mode of its occurrence; as I have seen in this country, a perfect apoplexy, to the eye, in all its characters, sufficient to deceive both the attending practitioner and friends, lasting for eight hours, and occurring in a chronic tertian of many years standing, as a substitute for the cold fit. A case has been mentioned to me in which a person in the first paroxysm of ague had an attack of convulsions in the place of the cold stage; in the next, the cold stage occurred as normally.

Case XLI., related by M. Bailly, seems very much to the point. A. G., of Milan, aged 35, of weak, lymphatic constitution. On July 5th, he entered a grotto, where he experienced a general sense of cold, which he attempted to shake off by drinking seven or eight glasses of wine; but could not, however, warm himself. He then felt a great weakness, which was the predominant symptom during the six days previous to his entering the hospital. His state had so little of a decided febrile character, that, according to his account, the medical man could not tell him if he had had the fever. He had a sense of general uneasiness; took an emetic and a purgative, and returned to his work; but the general state of disease and uneasiness increasing, as likewise the weakness, on July 11th, in the morning, he came to the hospital on foot, supported by a man on each side. Being arrived in the first ward, where I first saw him, he seated himself upon a form, and appeared to feel ill. He let himself fall down upon the right side; but the expression of his countenance was not that of a person fainting. There was something in the motions of his head, of his eyes, resembling those symptoms produced by drunkenness, and not that want of power occasioned by the cessation of the motions of the heart. He was merely supported, and recovered; and he was then enabled to ascend more than thirty steps, in order to reach the clinical ward. When in bed, the following was his condition: pulse frequent, weak; temperature of thighs, legs, hands, and arms, cold; tongue moist, and not red. He was able to give a history of his previous state; nevertheless, he begged the physician to question his companion, who accompanied him to the hospital; for, although he had neither delirium, nor coma, nor syncope, he appeared so confused, so little master of his ideas, that he declined to give any account of it. He had subsequently delirium, agitation, and drowsiness, and died the evening of the following day. There was much bloody serum in the cranium; the arachnoid was minutely injected; the vessels ramifying over the convolutions were engorged; the cortical substance of the brain was rather pale, and its mass of soft consistence. There can be no question that, in this case, the action of the malaria for six days was simply to weaken and impair nervous power.

For the following very interesting and instructive case I am

indebted to Mr. Stewart. A general officer, aged 60, who had served in the Peninsular war, and at Waterloo, and subsequently in Portugal, had had frequent attacks of intermittent fever, and for twenty years had suffered from spasmodic asthma. I was sent for in a hurry to see him last May, and found, on my arrival, that he had lost all power over the left side, and had very little sensation. The muscles of the face on the affected side were all relaxed, while those on the opposite side were rigid and drawn. Tongue protruded towards the opposite side; speech imperfect; urine dribbling away; bowels opened three hours before the attack. Complained of nervous pains in the head; had considerable difficulty of breathing; retained his consciousness; and, but for the difficulty of speaking, would have answered my questions correctly. Pulse 100, weak, and small; skin hot and dry; thirsty; tongue thickly coated; pupil on affected side contracted; on the right, sensible to light. Upon inquiry, I found that he had had similar attacks before (for which he had been bled and mercurialised), as well as asthma and ague. This information led me to believe that the prostration of the nervous power might be dependent upon some miasmatic poison, particularly as he had recently been staying near Woolwich. I therefore gave him six grains of quinine, and some warm drink. About a quarter of an hour afterwards he had a very slight rigor, followed quickly by heat, and almost immediately by profuse perspirations. During the following week he had every alternate day an ague fit, in which the hemiplegia recurred, but more slight. The rapid disappearance of the paralysis, and the nonimpairment of the intellect, in this case, make it, I think, certain that it was not dependent on congestion.

The error of depleting and mecurialising such patients, which was committed in this case by the highest authorities, is most strongly pointed out by Dr. McCulloch. He states that such practice may produce "a modified fatuity, or a diminution of the intellectual powers, or a condition little short of absolute idiotism." One of the most striking and interesting forms of palsy which malaria is capable of producing is that of syncope. This seems scarcely known even to men of great experience in this country; and yet it certainly does occur, and it is of the last importance to be aware of it. I have seen a man lie for more than twenty-four hours, unable to raise himself, and in considerable danger of dying from frequently recurring failure of the heart's action. After he had taken twenty grains of quinine, the syncope did not return. He had previously suffered from ague and neuralgia, and had a few days before visited a malarious district. M. Trousseau alludes to two cases of this kind. In the first, a man, aged 35, of good constitution, felt some lipothymic symptoms, which soon ceased, and recurred the next day at the same hour. No preventive measures were taken, and in the third attack the man dies. No adequate cause for the fatal event can be found at the *post mortem*. A young lady, aged 19, is affected in the same way; but

after the second attack bark is administered rapidly in full doses, and the patient is straightway cured. Torti relates a case of syncopal tertian, which appeared almost utterly desperate, but yet, after the last rites of the Romish Church had been administered, the patient was snatched as if from the jaws of the grave by the use of bark. Cardiac paralysis was no doubt the cause of death in some of the cases at Walcheren, of whom Sir G. Blane says, "Under the influence of the endemial air, recoveries were slow and imperfect, and relapses very frequent, not only among the few who were discharged, but among the convalescents at the hospital, some of whom, when apparently in a fair way of doing well, would unaccountably drop down dead." Slighter degrees of the same affection are, I believe, far from uncommon as sequelæ of the Crimean fevers. In a case of remittent fever under my own care, the patient was attacked one night by an alarming sensation referred to the heart, attended with faintness and a failing pulse. He thought himself dying, and said it seemed as if life was ebbing from him gradually. After he had become convalescent, this cardiac neuralgia continued for some time to recur about every second day, and was especially induced by any painful emotion or agitation. I have experienced the same sensation to some extent in my own person, and noticed its alternation with neuralgia in other parts. While it exists, it has the effect of causing the exertion of walking to produce a sense of weariness and fatigue about the heart before any is felt in the legs. I shall have to refer to these cases again; but I will now only observe here, that a good deal of evidence seems to have been adduced to prove the truth of Dr. McCulloch's statement, that the action of malaria on the nervous system is, of and by itself, essentially debilitating and prostrating. To say anything of engorgements of the liver and spleen, and of dropsy, as results of malarious disease, is unnecessary.

The following instance of the production of *gastric disturbance* by malaria is very striking and interesting. It is mentioned in an excellent paper by Mr. Hyslop, on the Medical Topography of Mohamreh and Bussorah, two places in the vicinity of the Persian Gulf. They are both situated on creeks, on a low alluvial soil, and surrounded with swamps. Fevers are very prevalent; they are common during summer, but more general and fatal in autumn. "Intermissions are seldom seen, and remissions even are rarely obtained. Organic visceral complications are almost universal, the liver and spleen being chiefly affected; and not unfrequently the disease assumes a malignant typhoid type. Should the patient recover from the first attack of the fever, it still lingers upon him for months, or even years, recurring at the new or full moon with the greatest regularity. In 1849 and 1850, a considerable party of Europeans was located at Mohamreh, where they were encamped on a dry plain, about a mile to the north of the town, just outside the gardens. They suffered severely from fever, which proved very fatal amongst the escort of

Turkish troops; but all were affected with a disagreeable complaint, to which they could assign no cause, and which no precautions could prevent. This was a constant vomiting after meals, which affected not only the party residing there, but also their visitors who remained with them for a day or two. It at length became so general and so distressing, that they gave up eating breakfast, and all became emaciated to a great degree. That this was not caused by anything deleterious in the diet, was proved by the fact that two parties who had separate messes suffered equally, and that many of the men in one of the H.C.'s vessels which was lying off Mohamreh suffered in the same way." The editor adds a note, to state that the Bombay Fusiliers were similarly affected in the Punjab. In these cases, the action of the malaria seems to have told on the nerves of the stomach producing a morbid amount of irritability. This was a primary neurosis, or neuralgia. Is there not very much similarity between this and some of our gastrodynias.

Dr. Morehead, in an excellent report on *Pneumonia*, as observed in the hospital at Bombay, has noticed the occurrence of this affection as complicating intermittent or remittent fever. His remarks relative to the effect of treatment seem to me most significant as to the real cause of the lung disease. He says: "From five to eight grains of quinine, with from one-tenth to one-quarter grain of tartar emetic, given at intervals of two or three hours for five or six doses, will in general suffice to check and then stop the febrile recurrences. When this effect on the febrile symptoms has been produced, it will generally be found that improvement in the pneumonia will at once commence; and, in a large majority of cases, if the recurrence of the febrile state be prevented for some days, the inflammation of the lung will be speedily removed." He adds in a note: "Indeed, I am not acquainted with anything more striking and satisfactory in the whole range of rational therapeutics than the progressive but speedy restoration of an hepatised lung, coexisting with fever of remittent type, *when the exacerbations have been controlled by the adequate use of quinine.* It is true that small local detractions of blood, the application of small blisters, and the use of quarter-grain doses of tartar emetic, have been had recourse to at the same time; but it is quite impossible for any one familiar with disease, and the actions of these means in these degrees, to attribute the benefit chiefly to them, and not to the circumstance of the prevention of the febrile exacerbation by the actions of the quinine." The pneumonia seems in these cases, which Dr. Morehead distinguishes from ordinary or "primary" pneumonia, to be the result of that action of malaria to be presently considered, which produces local determination of blood, or congestions. The number of the febrile cases was 27, that of the primary 76, making a total of 103 in the course of six years.

Abnormal increase of the secretion of various glands may, I believe, be stated unhesitatingly as one of the results of malaria. Dr. Copland

describes a variety of jaundice as depending upon excessive production of bile. It is most frequent in miasmatous and tropical countries, but also occurs in the temperate. I have known it precede remittent fever, or rather become converted into it as the patient was removed from the malarious locality. According to the authority just cited, it is connected with biliary remittent fever in temperate climates and in European constitutions, and "is most appropriately treated by the means most serviceable for the constitutional affection; but it sometimes continues or returns after the fever has disappeared." Fluxes from the lachrymal and salivary glands are common attendants upon neuralgia of the nerves supplying them and the adjacent parts. Torti relates a case of pernicious tertian fever, in which (he himself being the sufferer) an extraordinary most profuse sweat broke out, and increased along with the fever. After a violent shock of neuralgic pain in the thighs, "as if they had been suddenly cut across," he describes himself "colliquari ex continuâ, et semper adauctâ sudoris, etiam malè tepentis, profusione." Frequently recurring perspirations, in a less degree, are exceedingly common phenomena in obscure aguish disorder. Dr. McCulloch mentions an instance of intermitting diabetes connected with intermittent fever, the commencement of the saccharine secretion never differing from what had been the former hour of the attack of the intermittent, or proceeding beyond its ancient limit, viz., six hours.—*Assoc. Med. Journal, Aug.* 9 *and* 16, 1856, *pp.* 668 *and* 699.

3.—ON THE TREATMENT OF SOME FORMS OF RHEUMATISM AND NEURALGIC AFFECTIONS BY ACUPUNCTURE.

By Dr. John Tatum Banks, Dover.

[Acupuncture is a valuable and instantaneous remedy in many cases of muscular atrophy or loss of power, from many causes, and especially from chronic rheumatism. The following case of a surgeon will afford an admirable illustration. In a letter to Dr. Banks, he says, that after riding hard, and perspiring profusely, he had to go out again, and took his gig: he had not gone far, before he was seized with chilliness, which was succeeded in the evening by slight fever, general aching, stiffness, &c. He got something warm and went to bed. The symptoms continued the same after the night's rest, and he says]

"On the fourth night from the commencement of the attack, I awoke after a short sleep, drenched in perspiration, experiencing extremely severe pain in, and rigidity of the muscles of, the chest, more especially of the left side and shoulder. The pain on attempting to move was excruciating. I found myself unable to expand the chest, and the breathing was wholly abdominal. I could not move from the posture in which I was at the time lying. A sense of oppression and heat about the sternum kept increasing, and the dyspnœa became so urgent that I was apprehensive effusion was taking place into the pericardium."

[Dr. Banks was called in, and regarding the case as one of a neuralgic and rheumatic character, affecting the aponeurotic and muscular structures, proposed acupuncture.]

"In the course of a minute or two after the introduction of the first needle, which was pushed downwards in contact with the lower portion of the sternum whilst I was sitting up, I experienced a sensation as if some strong tense structure, which had previously bound down the sternum, had suddenly given way. This sensation was followed by a sense of approaching syncope, which was removed on lying down. While in the recumbent position, I found to my surprise and delight, that I could take a deep inspiration freely. But the muscular pain still continuing, and encouraged as I was by the great relief in my breathing already afforded, I now, on my part, anxiously wished for the introduction of other needles along the course of the fibres of the several muscles affected. This having been done, I felt, in the course of about ten or fifteen minutes, no uneasiness whatever in the chest, and was able to move about in any direction—indeed, so great was the relief, that after the removal of the needles I was able to dress myself with ease. During the remainder of the evening of the operation I felt well, but on the following morning, and for about a week after, I experienced some stiffness (but unaccompanied with pain) in the left side, which a second introduction of three needles, together with a slight anodyne for a few successive nights, entirely removed.

"In this statement I have endeavoured to relate my case as faithfully as possible, and I find it difficult to express in words the rapid and most extraordinary relief—as if by a charm, afforded by the insertion of the needles. Beyond the relation of the case, I have forborne to offer any remarks."

In venereal rheumatism, and in acute inflammatory rheumatism—where the blood is circulating through the system a poisonous material; and in all cases where there is evidently a *constitutional* origin, or disorder of the hepatic functions, with derangement of the digestive organs and secretions, giving rise to impurities which enter into and circulate with the blood, and which need to be expelled or eliminated from the system before a cure can be expected; in such cases of rheumatic suffering, no relief can be looked for from the introduction of needles. But in all cases of rheumatic and neuralgic pains, either acute or chronic—whether lumbago, sciatica, or pleurodynia,—or those of an erratic kind (no matter where situated) which are not dependent upon an inflammatory state, upon a constitutional origin, or upon organic disease; provided the patients are most comfortable when warm, *and are decidedly relieved by the application of heat:* in all these cases it may, I think, be confidently affirmed that they will be singularly benefitted by acupuncture, which will not only afford relief, but in most instances effect a cure.—*Lancet, June* 14, 1856, *p.* 653.

DISEASES OF THE NERVOUS SYSTEM.

4.—REMARKS ON THE METASTASIS TO THE BRAIN IN GOUT AND OTHER DISEASES.

By Dr. Francis James Lynch.

When an abrupt and sudden transference of diseased action to the brain and its membranes takes place in the course of gout, rheumatism, mumps, erysipelas, phthisis, pneumonia, or other morbid conditions of the system, the resulting cerebral symptoms vary to a very remarkable extent. Thus, when gout abandons partially or entirely its ordinary seat, and seizes on the brain, we have in one case all the symptoms of an ordinary apoplectic seizure, requiring, or at all events yielding to, active antiphlogistic treatment; in another, the symptoms of cerebral mischief are less urgent, but more protracted in duration, the cerebral congestion in which they originate either gradually disappearing, or ending in ramollissement or various forms of disorganization of the brain or its investing membranes; while in other instances of gouty metastasis, hemiplegia or general convulsions result from the translation of gouty action from the extremities to the brain, the epileptic fits being followed by more or less coma for some hours or days. Lastly, true phrenitis or maniacal excitement, which occasionally lapses into confirmed insanity, or into a condition allied to that which exists in delirium tremens, may be observed.

When metastasis to the brain occurs in the course of *acute rheumatism*, the sudden disappearance of the disease in the articulations is followed by symptoms of cerebral engagement, which vary much in different cases. Metastasis to the brain in acute rheumatism runs a rapid course, and proves speedily fatal, unless the constitutional strength of the patient, and the early detection of the cerebral complication, permit of prompt and decided antiphlogistic treatment. In almost all the recorded instances of rheumatic metastasis to the brain which I have met with, death resulted in from a few hours to four or five days, when general and local depletion, mercurialization of the system, and the other details of the antiphlogistic treatment, could not, owing to the patient's weakness or prostration, be employed; nothing but decided measures will save life; mere local depletion will generally fail in a disease which destroys life in a few hours or days. Severe headache, intolerance of light and sound, pyrexia, flushed face and suffused eyes, followed by rambling and delirium, suddenly supervening on the abrupt disappearance or subsidence of the local rheumatic affection, is the rarest form of rheumatic metastasis to the brain, and, if associated with a full and bounding pulse, is by far the most amenable to treatment. When such symptoms, however, arise, we should not forget that one of the most insidious and fatal forms of rheumatic pericarditis is ushered in by a similar group of cerebral symptoms, and an entire absence of the ordinary signs, at least the rational ones, of pericarditis.

In some instances of rheumatic metastasis to the brain, the cerebral attack is announced by headache, more or less severe, intermittent, or constant, and lasting for some hours or days, followed by hemiplegia, coma, and death in a few hours or days. In other instances there is an entire absence of headache; there is merely a sense of weight or tightness in the head; the countenance is wild and anxious; there is intolerance of light and sound; rambling, followed by more decided delirium, ensues; then strabismus, coma, and sinking. Lastly, rheumatic metastasis to the brain occasionally assumes an aspect not unlike one of the forms of gouty cerebral metastasis, viz., the disappearance of the local affection of the joints being followed by loss of memory, particularly of proper names, ending in more or less complete loss of speech or memory of words, strabismus, sighing, yawning, moaning, preceded or accompanied by fits of screaming, and finally ending in more or less stupor, interrupted by gleams of returning consciousness, until death closes the scene, without any headache or giddiness being complained of from first to last.

In some of the forms of rheumatic metastasis above described, the pulse will be found to be full and bounding: here active measures have a fair chance of saving life, if early and perseveringly employed. In other cases the pulse is weak, irregular, and intermitting; the face is pallid; the surface inclined to be cold, and the patient worn out by the previous rheumatic attack, or the active measures used for its relief. Under such circumstances the chance of recovery is but small. On examination after death, in such cases, we find, sometimes, more or less serous effusion into the ventricles and upon the surface of the brain; the arachnoid membrane appears to be thickened, and often there is subarachnoid effusion of a greenish gelatinous fluid, and increased muscularity of the substance of the brain. In a case recorded in 'The London Medico-Chirurgical Review,' the cerebral seizure seemed to be in some measure traceable to the too active treatment of the preceding rheumatic affection of the joints by leeches, &c. In all diseases where a tendency to metastasis to vital organs is known to exist, we should be slow to use active measures for relieving the parts in which the disease originally locates itself.

In concluding this subject I may mention, that in the course of acute rheumatism the brain may be attacked in the various ways I have described, without any accompanying subsidence of the affection of the joints, just as pericarditis may spring up and follow its usual course without any change in the state of the articulations.

It is well known that, during the course of an attack of *cynanche parotidæa*, metastasis occasionally takes place to the testes, mamma, or brain; and this tendency to metastasis appears to be greater in some epidemics than in others. During the year 1850 mumps were very prevalent in this neighbourhood, and numerous instances of metastasis to the testicles, in the course of the disease, fell under my notice. In one remarkable instance, in which the disease affected the

entire family, several of whom were adults, the disease in one case first appeared in the testis, the salivary glands having become subsequently engaged. And in Underwood's work on the Diseases of Children, an epidemic is described in which it frequently happened that the testicles alone were affected. In the fourth volume of "The Edinburgh Medical and Surgical Journal," page 104, an account is given of some cases of mumps occurring on board ship, in which twelve persons were affected with the disease: all were adults, and in all there was metastasis to the testicles, and in two out of the twelve to the brain.

Metastasis to the testicle is seldom observed except in adults; but both in children and in adults improper treatment will cause a translation of the disease from the salivary glands to the brain: thus, Sir Astley Cooper has seen an instance of fatal pressure on the brain resulting, in a boy eleven years of age, from the application of a cold evaporating lotion over the inflamed parotids.

The head is liable to be affected in many ways in the course of mumps: high fever and delirium may accompany the disease when confined to the salivary glands, or the same symptoms may attend on the testitis when the latter is severe; the head affection, in both cases, being the result of excessive local inflammation, either in the original seat of the disease or in the testicle. Lastly, the head may become engaged upon the subsidence, either of the inflammation of the salivary glands or of the testicle, giving rise to the metastatic phrenitis or cerebral irritation in some cases,—as occurred in the epidemic referred to,—announced by severe headache; a feeling of tightness, as if the head was bound round by a tight cord; suffused eyes; a wild expression of countenance, and intense pyrexia; requiring general or local depletion, blisters to the shaved scalp or to the nape, cold applications to the head, drastic purgatives, the administration of mercury, and warm fomentations to the scrotum.

When *erysipelas*, particularly of the head, is on the wane, and the patient is progressing favourably, just when the swelling has almost disappeared, and the cuticle is scaling off, delirium of an active character not unfrequently sets in; the patient talks and acts like a person in delirium tremens: there are the same restlessness, loquacity, anxiety to leave the bed, and total want of sleep, which are observed in delirium tremens; in addition, the pulse becomes very rapid, the face flushed, the head hot, and the patient very often cannot, as is the case in delirium tremens, be got to answer questions unconnected with his delusions rationally. A case of this description is related in Andral's Clinique Médicale; it was cured by opium, after the previous ineffectual use of general and topical bleeding.

I have seen several such cases; in some the symptoms spontaneously disappeared; in the more protracted forms, opium and a sustaining regimen were, as in Andral's case, successfully employed; in a few instances in which the symptoms of cerebral engagement presented at

first on the subsidence of erysipelas were identical with the above, the severe headache, delirium, and restlessness were after a day or two followed by coma, convulsions, and death. Two such cases are given in Parent Duchatelet's work, "Sur L'Arachnite", and the chief morbid appearances were gelatinous effusion under the arachnoid, and thickening of the latter membrane.

In the course of *phthisis pulmonalis*, the pulmonary symptoms sometimes disappear, or become remarkably mitigated on the sudden supervention of alarming indications of cerebral mischief, the head affection running a rapid course, very similar to what is observed in the severer and more dangerous forms of erysipelatous metastasis to the brain. The violence of the headache, its sudden approach, and the patient being, perhaps, subject to rheumatism, sometimes causes the complaint to be mistaken for neuralgia or rheumatism, until the appearance of delirium, convulsions, and coma discloses the real nature of the attack; in the few cases I have observed of this description, the headache in the commencement of the attack was uncommonly acute, the patients cried out, were unable to sleep, and paced the room in agony. In one of these instances the administration of a very small dose of the muriate of morphia was almost immediately followed by insensibility and death. In two such cases, which I had an opportunity of inspecting after death, there were several small miliary tubercles embedded in the pia mater at the base of the brain, which by their irritation had evidently induced a fatal amount of arachnitis in their vicinity. The disease runs a very rapid course, and ends fatally in a few days, being in general wholly uncontrolled by medical treatment.

The sudden and more or less complete cessation of all the rational symptoms of phthisis, which many physicians have observed to take place on the supervention of insanity, is a very remarkable instance of the metastasis of morbid action to the brain; in the majority of such cases the course of the pulmonary disease is only suspended for a time, but in some rare instance the disease in the lungs remains dormant or latent during life. I know of one instance, which I myself witnessed, in which the insanity has continued for fifteen years without any return of the symptoms indicative of phthisis.

In the course of certain forms of *bronchitis*, and more especially of *pneumonia*, a transference of diseased action from the lungs to the brain is occasionally, but rarely, observed; the morbid affections of the two organs seem to alternate with each other; the pulmonary symptoms disappearing on the accession of the cerebral, and the latter, in their turn, ceasing on the return of the pectoral affection, which in such cases is usually of a very formidable character, and not so speedily amenable to the usual remedies as ordinary pneumonia of a more sthenic character.—*Dublin Quarterly Journal, May*, 1856, *p.* 276.

5.—HYSTERIA, AND ITS RELATIONS TO ORGANIC AFFECTIONS OF THE GANGLIONIC CENTRES.

[Dr. Gull, of Guy's Hospital, in a clinical lecture on a case of total hemiplegia, or what appeared to be hemiplegia, occurring in a young woman, remarked that,]

In seventy-five per cent. of hemiplegic cases, he believes there is old standing cerebral disease of the thalamus opticus and corpus striatum. The patients are not young, as a rule; and an additional line of distinction is this: the hemiplegia of hysteria does not affect the muscles of the face. The paralysis of chronic disease attacks the opposite side and the arm most—sensation is affected less than motion; while, in hysteria, though the disease of hemiplegia is imitated very wonderfully, yet the eye of the surgeon generally detects some irregularity: for, where real disease exists, preponderating loss of sensation exists, rather than of motion; and the hemiplegia is either functional or the result of blood disease.

There is good reason for supposing that the thalami optici are the ganglionic centres of common sensation, as affected, for instance, by chloroform; and that the sensory columns ascending from the posterior pyramids of the cord pass through this part, while the motor fibres, that pass forward from the anterior pyramids, pass chiefly through the corpora striata. These contain vesicular matter in their substance, also demonstrating their independent function; and they are the point of departure of a new set of fibres passing to the proper cerebrum. In the lower animals, they are the centres of consciousness; while the super-addition of the cerebral hemispheres in man alters their endowments very little. Mere functional derangement of these parts, or the consensual actions to which they give rise, causes hysteria. A large part of the fibres of the anterior pyramids decussate; hence the hemiplegia of disease is so marked at one side. Sir B. Brodie believes that hysteric patients feigning paralysis have a disease of the will. The more popular sense of the matter is, that it is a feigned disease altogether; but Dr. Gull does not believe this to be so true or philosophic as the explanation of Sir B. Brodie, who endows the will with almost a new organisation, or a new function in the brain, irrespective of its origin, in consciousness, emotion, and impulse.

The following case has been in St. Bartholomew's, under Mr. Skey.

H. S., aged 17 years, was admitted June 19th, with excessive pain in the back, to which her friends had applied relays of leeches and mustard poultices. Mr. Skey at once detected it to be hysteria, and in ten days she was well.

Mr. Skey, in addressing his class, said he did not willingly undertake to say anything about hysteria, as it is so much a medical disease; yet if it will intrude, in some of its Protean disguises, on the domain of the surgeon, he must get rid of it.

In a remarkable case, of a similar kind to the preceding—hemiplegia of the left arm and leg, in a young woman recently admitted into St. Bartholomew's, and noted in her village as a cripple, and completely paralytic—Mr. Skey observed, the pulse was good, the general appearance of the patient not unhealthy, her face not paralytic, appetite good, and something in the general character of the case which led him to suspect hysteria. She could not make the slightest effort to use her limbs ; but in a month after, under the effects of *steel and valerian*, she was walking about the ward, comparatively cured.

Mr. Skey said he was never so much struck with the idea of "diseased will" as in this case. In ordinary paralysis, the woman would probably stir her fingers a little ; but this woman did not stir her limb, no more than if it were marble.

A very important question for the surgeon, according to Mr. Skey, is, Why does hysteria so often attack the joints, and simulate organic disease ? In all such cases, he believes, there is a previous tendency to irritation—that irritation which precedes inflammation, scrofulous or otherwise. A hysteric knee is certainly not a healthy knee. Hysteria hovers about—a sort of *silhouette* or shadow of real disease ; but by strengthening the system by tonics, the capacity of the parts to convey this irritability to the central parts of the brain, as well as the irritability itself, is changed.

A great point in the diagnosis of another case of what was called marked spinal disease was to direct the attention or will away from the spine, and fix it somewhere else ; and, if hysteria, the patient recovers. In all these cases, there is a manifest tendency to irritation, combined perhaps with deranged consciousness, which tonics and valerian will be found most valuable in rectifying.

The *will*, it need hardly be observed, is made up, perhaps, of consciousness, emotion, and impulse ; but if the perceptive faculty is in abeyance, or consciousness disordered, the will is in abeyance also. Patients in this state will chew sawdust, assafœtida, chalk, &c. It is not impossible also that the correlated association of parts engaged in the will are disturbed : the sensory or auditory ganglia take up the sentient impression, but its passage forward to the seat of thought is delayed, or, *vice versâ*, wrong impressions are conveyed ; or, from uterine or other derangements in the blood itself, the entire functional integrity of this part of the brain is disordered. This is further explained by the interesting fact, now pretty well understood, that the sense of taste so disordered (as in those patients who chew sawdust, chalk, &c.) is only a refined kind of touch combined with the sense of smell ; and where we have diseased will, as in this case of Dr. Gull's, putting on the semblance of hemiplegia, it is only the same affection, in another of its harlequin shapes, affecting the sense of touch of an entire limb. Some years ago, as Mr. Skey remarked, all the sea-bathing places on the coast were filled with spinal cases in summer, but nine-tenths of these were cases of hysteria.

In another case, at present in University College Hospital, which appeared, on admission on the 9th inst., to be shortening of the hip, almost amounting to diseased acetabulum, with pain of the articulation, Mr. Erichsen could only detect some very slight irritation in front of the hip-joint, "mixed up with a great deal of hysteria." The patient, a stout healthy young woman, seemed to have a facility of throwing the toe of the diseased limb on the ankle of the opposite side, with hysteric shortening, like actual dislocation. It is probable, in such instances as this, we have the opposite limb stretched out so as to relieve a fancied or real irritation in the hysteric articulation, or we may have a condition allied to hemiplegia. Mr. Erichsen ordered the compound steel mixture and good diet, and some fomentation if necessary. This patient is much improved by the treatment.—*Association Journal, July* 19, 1856, *p.* 602.

6.—*Cephalalgia. Hydrochlorate of Morphia in Coffee.*—M. Boileau relates an obstinate case of cephalalgia, which he treated by hydrochlorate of morphia dissolved in strong infusion of coffee. The attacks occurred especially on any exposure of the head to cold air, and had resisted the operation of each of these remedies separately. It ceased almost immediately after taking them in combination, and by repeating the dose on each recurrence of the pain, the attacks became less frequent, and at length disappeared. M. Boileau says that he has found it successful in many other instances.—*Brit. and For. Med Review, July* 1856, *p.* 240.

7.—*Convulsions.—Chloroform Inhalations.*—M. Marotte relates the case of an infant, eleven months old, suffering from convulsions, with spasm of the glottis, during dentition. Chloroform was very cautiously administered, with immediate relief; and in half an hour sleep was procured, and kept up by occasional respiration of the vapour for two hours, and then natural sleep ensued. Several relapses occurred —decreasing however in severity—each of which was treated in a similar manner; and altogether, 45 grammes of chloroform were expended.—*Brit. and For. Med. Review, July* 1856, *p.* 240.

8.—*Case of complete Dumbness and Aphonia, of Twelve Years' standing, rapidly Cured by Electricity.*—Prof. Sedillot, of Strasburgh, lately brought this case before the Academy of Sciences of Paris. The details run thus:—The patient, a woman, thirty years of age, had been visited twelve years before admission (Nov. 19th, 1855) with complete dumbness and aphonia, in consequence of a fright. Various modes of treatment had been tried without success. The

patient understood everything said around her, and answered by gestures; but could utter neither word or sound. The tongue was retracted, and directed upwards, the woman, not being able to bring the apex in contact with the teeth. Deglutition and general health good.

Prof. Sédillot suspected a paralysis of the genio-glossi, and the muscles connected with the chordæ vocales. Inductive electricity was, therefore tried, one pole being placed alternately on different parts of the tongue; and the other, on the mastoid process, the superior and posterior part of the neck, and various points of the face. Some pain was experienced, but the tongue moved more freely. The first sitting lasted merely a few minutes, and was not repeated until one week afterwards, owing to severe headache, which had followed the application of electricity.

After the second sitting, the tongue could be protruded between the lips, and the patient began to talk distinctly, though the voice had not as yet quite returned. Pain was experienced in the region of the styloid process and the hyoid bone, when efforts at articulation were made, depending, very probably, on the fatigue of the muscles, which had just recovered their tone. The improvement became more and more manifest by a few more sittings; and, a fortnight after the last, the patient returned home perfectly restored. Several cases of recovery of speech, by means of electricity, have been recorded; but none in which the affection was of such long standing, and so rapidly cured.—*Lancet, May* 10, 1856, *p.* 516.

DISEASES OF THE ORGANS OF CIRCULATION.

9.—ON THE MECHANISM AND SOUNDS OF THE DILATED HEART.

By Dr. W. T. Gairdner, Lecturer on the Practice of Physic and on Clinical Medicine, Edinburgh.

[The doctrine of Laennec, which has been adopted by Hope, and other writers, in regard to the modification of the heart's action in hypertrophy and in dilatation of the organ, have not been submitted to nearly so searching a criticism as they appear to require. The results of Dr. Gairdner's inquiries tend to somewhat different conclusions from those currently adopted. It will be convenient to start from the statements of Hope, as they are substantially the same as those of Laennec.]

"The first sound" (in *simple hypertrophy*), says Hope, "is duller and more prolonged than natural, in proportion as the hypertrophy is more considerable; and when this exists in an extreme degree, the sound becomes nearly extinct, but never, according to my observation, wholly so, as stated by Laennec. The second sound is weaker than

natural. Laennec says, that in extreme cases it is scarcely perceptible, but I have always found it distinct when the stethoscope was placed about an inch or two higher up than the sigmoid valves.

"The first sound in *dilatation* becomes loud, brief, and clear, like the second. This arises from the muscle, in consequence of its thinness, contracting with increased facility and velocity; whence the extension of the auricular valves with their chordæ tendineae, and of the muscular walls themselves, is more sudden and smart. The sound is not prolonged by *bruit musculaire*, apparently in consequence of the feebleness of the contraction. In dilatation with attenuation, the first sound is often so brief and feeble a click, that I believe it to be produced by valvular extension alone.

"The second sound is more or less increased, because the thin ventricle, from having greater facility of movement, performs its diastole, as well as its systole, with greater velocity; whence the recoil of the sigmoid valves is more sudden. In dilatation, with extreme debility of the organ, however, I have often found both sounds weaker than natural, from the excessive feebleness of the organ."

It would be easy to show how largely the teaching of our schools and text-books have been influenced by these propositions; but as this is of less consequence than to inquire wherein they are erroneous and uncontradicted, I shall limit myself to the latter investigation.

The statement of the signs of dilatation here given is, I believe, completely at variance with fact and with observation. It is difficult, indeed, to imagine whence the materials could have been drawn for a description of mere dilatation, apart altogether from other morbid changes; but in so far as cases of predominating dilatation are concerned, I have sought in vain for any increase in the clearness of either sound of the heart as resulting from it. The whole phenomena of dilatation have appeared to me to consist, not in an increased, but a diminished clearness of the sounds, as compared with those of the heart, or of the hypertrophied organ. In short, they have been the phenomena of an enfeebled heart, modified by certain circumstances, which will be afterwards described. The phenomena of dilatation can rarely, if ever, be observed in such a way as to permit us absolutely to separate them from those of hypertrophy. But the latter condition is often found to terminate in predominating dilatation; and in such cases, when watched over a lengthened period of time, it is not difficult to observe the gradual modification of the sounds which indicated the yielding of the cavities of the heart to the pressure of the blood; a change usually accompanied by a marked increase in the severity of the secondary symptoms. In such cases, it has invariably occurred to me to observe precisely the reverse of what has been stated by Laennec and his followers, viz., that the clearness of the sounds (and especially of the first sound) has been maintained up to the point when the great increase in the

dimensions of the heart, the feebleness of its action, and the supervention of dropsy and other complications, gave reason to suppose that dilatation had become considerable; and that from this period till death, the clearness both of the first sound, and of the second sound corresponding to the dilated ventricle, has constantly diminished, until, in extreme cases, both sounds have become nearly extinct.

In almost all the works in the hands of our students, in the present day, I find the error of Laennec (if error it be), more or less distinctly reproduced. By Skoda, whose works might almost be regarded as a professed criticism on Laennec, his statements on this subject are passed over in silence; but the opinions of the German reformer of auscultation very clearly do not correspond, in this matter, with the doctrine of the "Traité de l'Auscultation Médiate." It is, however, only in the work of Dr. Stokes that I find the doctrine of Laennec distinctly disclaimed. "Laennec has stated," says Dr. Stokes, "that a certain clearness or sharpness of the sounds attends the dilated state. This can hardly be admitted, unless we suppose a case, in which there are the combined conditions of thinning of the parietes, with an increased vivacity or force of the muscular contraction. Whether such a state of the heart ever exists is very doubtful; and it is not improbable that, in the mind of Laennec, the connection between clearness of sound and thinning of the parietes of the ventricles was but a corollary to his doctrine—that the second, or clear sound, was produced by auricular contraction." This remark, taken in connection with the passage above quoted from Dr. Stokes, in a foot-note, may be taken as amounting almost to a denial, on his part, that the doctrine of Laennec has any foundation in nature.

If a statement be incorrect in fact, it is of little consequence on what theoretical view it has been founded. The disproof of Laennec's assertions must, in the first instance, therefore, be the result of exact observation; and, unless my remarks on this subject are consistent with what has been observed by others, Laennec's doctrine will probably continue to be held and taught as correct. But, it is impossible to refrain from observing, that the suggestion of Dr. Stokes, as to its theoretical origin, is, to say the least, extremely probable. We know, as a fact, that Laennec, careful and exact as he undoubtedly was, was misled into many erroneous opinions, by his idea that the second sound of the heart was caused by the contraction of the auricles. It was a clear sound—the auricles were large cavities with thin walls; therefore it was inferred that the ventricles, when brought by disease into a somewhat similar condition to the auricles, would give a somewhat similar sound. Moreover, the same conclusion appeared to follow, from the examination of the first sound over the right, as compared with that over the left, ventricle. The latter appeared to be more dull. The thinner wall, therefore, in this case too, gave the clearer

sound: a fact, however, which is, in reality, sufficiently explained by its greater proximity to the surface.

It is worthy, also, of remark, as bearing on the evidence by which Laennec's opinion on this point is supported, that even Hope's clear and precise statement of it is guarded by a most significant qualification. "In dilatation, with extreme debility of the organ, I have often found *both sounds weaker than natural*." A similar qualifying clause occurs in Dr. Walshe's book. "The systolic sound, short and abrupt, may be unnaturally clear, both at the apex and base, if the heart's tissue be firm. . . . . If the dilated ventricle be soft, flabby, or fatty, the first sound may be very weak, faint, and toneless; and the second so feeble as to be inaudible at the apex, especially if the heart's rythm be markedly irregular." Now, I by no means deny that a healthy heart, in excited play, and struggling with an increased quantity of blood, will give rise to an increase of one or of both sounds; or that an hypertrophied heart, in like circumstances, may do so to an even greater extent. In strictly morbid dilatation, however—much more in perfectly uncomplicated dilatation (if such a disease be admitted to exist)—feebleness of the heart's action must always be expected to be commensurate with the degree to which the cavities are abnormally distended. Such feebleness is, in effect, always found in permanent dilatation; and therefore, to say that clearness of the sound is characteristic of dilatation *only in those cases in which the ventricles are not enfeebled*, is, in other words, to say that this sign is not characteristic of dilatation at all, but of some other condition with which dilatation may be allied.—*Edinburgh Med. Journal, July*, 1856, *p.* 55.

DISEASES OF THE ORGANS OF RESPIRATION.

10.—ON ASTHENIC PNEUMONIA.—TREATMENT BY QUININE.

By Dr. Corrigan, Physician in ordinary to the Queen in Ireland; Physician to the Whitworth and Hardwicke Hospitals, &c.

[We must take care not to fall into the too common error of mistaking the name of a disease for its nature. There is a great tendency to substitute book reading and knowledge of names of diseases merely, for the troublesome task of reading disease in nature's book at the bedside. This is the only way to acquire a thorough knowledge of disease and make good practitioners.]

Let us now proceed with the illustration of our first point, that *the name of a disease is not an index to its nature or its treatment*. With the name of "pneumonia" you generally and properly associate the ideas of sthenic vascular action of the capillaries, of throbbing of the arteries, increased action in frequency and strength of the heart, and with the accompanying symptoms of flushed face, pink lips, hot breath

burning heat of skin, high-coloured and scanty urine, and orange-coloured viscid sputa. With these there will be naturally associated, as to treatment, bleeding and tartar emetic, those remedies that possess such power over high inflammatory action and over pneumonia, as we have sketched it; but if you were to imagine that the name "pneumonia" always indicated the same nature in the disease going under its name, you would fall into a very grievous error in knowledge and in practice. Pneumonia occasionally means a state of disease the very opposite in character to the picture first drawn, and requiring a very opposite treatment. It is this knowledge, so as to recognize the altered character of the disease, which you can only learn in clinical study.

To make my observations as simple and as easily intelligible as possible to you, I will confine my observations to what is usually called the first stage of pneumonia, that is the state in which, if a patient die, the lung will be found dark-coloured, from the great quantity of blood contained in it, its capillaries congested, distended frequently beyond their natural calibre, its smaller air tubes loaded with effused fluid, and the whole lung pitting on pressure and much heavier than natural. Bear in mind next, the peculiar structure of the lung, resembling, as it were, two large sponges, made up nearly altogether of a great congeries of vascular capillaries, the capillaries of the pulmonary artery loaded with venous blood, and those of the pulmonary veins with arterial blood.

Now let me recall to your mind one of your earliest physiological lessons. If the capillary vessels of the web of a frog's foot be stimulated, the effect of the stimulation is very soon to cause a distension of the capillary, and a more rapid movement in the contained blood. This, along with the momentary preceding contraction is its sthenic state, for all that is necessary to enable it to return to its healthy state, is to withdraw the stimulant, and the capillary contracts of itself. But if the distention and stimulation be continued another phase occurs: the blood becomes darker, the circulation becomes slower, the capillary has lost its power of contracting, and, to enable it to return to its healthy contractile state, the application of some stimulant is required, when under its influence the capillary regains its lost power, and it again returns to its previously healthy state.

Now, this simple experiment is really the key to the sthenic and asthenic states of the vascular system, and is the foundation on which we rest our principles as to the treatment of pneumonia, which I bring before you.

Carry your mind's eye from the experiment on the frog's foot to what goes on in some forms and types of pneumonia, and you can no more doubt of what is taking place in the lung within the interior of the chest, than you can doubt your ocular evidence of what you see in the experiment. In the first stage of an attack of pneumonia, in a healthy constitution, with the whole capillary system, including, of course, that of the lungs, in possession of its ordinary vigour, the ca-

pillaries become distended, but still preserve their sthenic state. In such a case the line of treatment is at once indicated ; venesection, to relieve their over-distention, and tartar emetic, to act both upon them and upon the whole vascular system, including heart and arterial and capillary system, are the great means of treatment upon which we rely. But if, from the state of constitution, or from the epidemic type of disease at the time, the capillaries do not retain their sthenic tone, they pass into the state exemplified in the experiment on the frog's foot, they lose their contractile power, and we have then to deal with quite a different state—with an immense mesh of pulmonic tissue, formed nearly altogether of capillaries that have lost their contractile power, and in which further depletion will be not only useless but injurious, for while its effect in lessening the distention would at best be doubtful, it would tend still further to aggravate that asthenic character which they now present ; and extension of the disease, increasing debility, exhaustion, and death will follow. It is to meet the supervention of this second or asthenic stage that you have seen me exhibit quinine in large doses; the result has been satisfactory, and it is the more satisfactory to know that its employment has not been a mere empirical experiment, but has arisen from considering the physiological state of the capillaries in the lungs, as illustrated by a physiological experiment, and revealed to us by an analysis of the symptoms. I will now shortly notice some of the cases.

The first case that suggested the treatment occurred in private practice. The patient was a man of about 35 years of age. He was attacked by pneumonia of right lung; he was a man of rather full habit, and flabby texture. The physical signs were the ordinary ones of the first stage. The constitutional symptoms did not indicate any very high degree of vascular action, and the treatment was of the usual kind, cupping, blistering, and calomel and opium. About the fifth day there was every symptom discouraging in this case. He became slightly jaundiced, or rather assumed a yellowish, sallow cast of countenance, the pulse became very full, very soft, and very yielding, and the expectoration presented the appearance of softened down dissolved blood. The lung had not passed into the second stage of the disease. He appeared now to be rapidly sinking, and it then occurred to me to administer quinine, guided by the principles that I have already explained. He got five grains of quinine every three hours, and the alteration in twenty-four hours was very marked indeed. The same treatment was continued for the next day, and within three days more he was out of danger. I never treated a case in which I was more satisfied of the efficacy of the medicine.

In this case the disease set in presenting a moderate degree of the sthenic form, but the capillaries speedily lost their contractile power, and then the asthenic form rapidly succeeded. Quinine appears to possess the same power in giving contractile action to the capillaries of the lungs, which we know it possesses in so marked a degree over

the capillaries and venous radicles in the spleen, and it may further support this view to recollect that both in lungs and spleen the capillaries are in a very large proportion venous.

This asthenic form of pneumonia may, however, exist from the very commencement of the attack, that is, either from type of disease, from nature of constitution, or from long-continued action of depressing influence, the capillaries of the lungs may lose their sthenic power from the very onset, and thus we may have asthenic pneumonia either as the second stage of sthenic pneumonia, or we may have it as the primary disease.

James Hayes, aged 21, previously a healthy man, was admitted into the Hardwicke Hospital on the 24th of March, 1856, complaining of pain in the right side, and of great dyspnœa. On examination, double pneumonia was discovered, both lungs were extensively engaged, but the disease had not gone beyond the first stage; there was extensive crepitation with bronchial respiration. The pulse was extremely rapid and small. The debility was extreme, and the surface of the body was pale and rather cool. He presented very much the appearance of a dying man. He was a boatman, constantly exposed to wet and cold, and for four days had been suffering under his illness, and all this time had lain in a canal luggage boat, on its way to Dublin, in extremely inclement and cold weather.

In the night the dyspnœa became so urgent that he seemed on the point of suffocating; from this he was somewhat relieved by draughts of ether and by wine. A blister was applied to his chest. The next day he was ordered five grains of sulphate of quinine every three hours, and the quinine was continued. On the 29th he was so much improved that the quinine was diminished to a dose three times a-day, and his convalescence then set in. I merely give you these cases in illustration of the disease and of its treatment; you have seen a great many cases of a similar kind treated here on the same principle during the past winter and spring, and I will now briefly sum up in propositions what I wish to impress on you in this lecture.

1st. That the name of a disease is not an index to its treatment; but that on the contrary, under the one name, the pathological conditions of the organ affected may change so much, as to require the most varying or even opposite mode of treatment.

2nd. That pneumonia presents an illustration of this principle, as it may be of a sthenic or an asthenic form.

3rd. That the asthenic form may be consequent on, or be the second stage of the sthenic form; or that the primary attack of pneumonia may be of the asthenic form from the commencement.

4th. That quinine in large doses is a remedy of great power over the asthenic form of pneumonia, whether it be primary or secondary.

I have only to add, that these observations as to the pathology and treatment of this form of pneumonia have reference to the disease in the stage of extreme congestion, or what is commonly called the first stage of pneumonia.—*Dublin Hosp. Gazette, July* 15, 1856, *p.* 177.

11.—ON PNEUMONIA, AND ITS TREATMENT BY SULPHATE OF QUININE.

By Dr. Samuel Gordon, Physician to the Whitworth and Hardwicke Hospitals, Dublin.

[The opposite modes of treating the same stages of this disease, and each equally successful, lead us to doubt the identity of the affection. We believe that the generic word pneumonia, as used by different authors, comprises several distinct forms of disease.]

Pneumonia, originating in the pulmonary capillaries, appears to be essentially a blood-disease, and sometimes comes on very suddenly, at other times more slowly; like all diseases of this type, it is often epidemic; it sometimes supervenes on other diseases, but often attacks persons who were previously in apparently good health. The great chemical alteration which the blood would appear to undergo, consists in the augmentation of the fibrine, but this augmentation taking place, amongst other modes, by the conversion into it of a more or less considerable quantity of the albumen: we thus have two distinct morbid actions taking place within the sanguiniferous system, one consisting in the removal of the great nutrient or formative power in the blood, and the other in the sudden engorgement of the capillaries with a great mass of (most probably) crude fibrine, which, partly from depressed vital action, and partly from mechanical over-distention, they are unable to transmit.

The appearance of a lung when seen in the *very early* stage of this form of pneumonia is very unlike that produced by acute inflammation of the air-vesicles of the lung. When first seen after the opening of the thorax, it presents a dark-blue colour. This appearance, however, is very evanescent, and is almost completely lost in the course of three or four hours after the lung has been removed. When grasped in the hand, it feels like muscle; but, unlike what is usually termed carnified lung, it is increased rather than diminished in size, but is not so much increased as in the more ordinary form of pneumonia: it is firm and heavy, and sinks in water, but does not appear to have any tendency to pass into any form of hepatization, nor does it afford any feeling of crepitation, or anything allied thereto. This description, which I have borrowed from my reports of the cases above alluded to, and from Dr. Corrigan's demonstration of the appearances before the Pathological Society, as well as from subsequent examination of other similar cases, appears to me to indicate a modification of pulmonary disease altogether different from ordinary vesicular pneumonia, nor yet to be confounded with pulmonary apoplexy, or "the collapse of the lung as connected with bronchial obstruction," described by Gairdner and others.

The symptoms which existed in those who died in this very early stage were great and sudden collapse, sudden lividity, and coldness of the surface; the lips became purple, and a dark flush arose on the

face; they complained of excessive weakness; there was great depression of strength—in fact, "in no case could the asthenic character be better marked." In some cases the patient complained of difficulty of breathing; but even when there was no complaint uttered, the increased rapidity of the respiratory acts—in one case they amounted to sixty in the minute—indicated great pulmonary obstruction. The respiration was usually diaphragmatic; the tongue was moist and dark-coloured; the pulse small, feeble, and very rapid; the surface of the body almost cold; there was seldom any complaint of cough, but there was frequently pain in the side, which was not always referred to the part where the physical signs showed the existence of disease. These physical signs were, great dulness on percussion over a certain portion of the chest, according to the extent of lung engaged, which did not seem to follow any precise rule; in some instances the upper part of the lung was affected, sometimes the lower, sometimes portions of both lungs: and, corresponding to the amount of dulness, there was either absence or great feebleness of the respiratory murmur.

Patients who died in this stage of the disease died generally of collapse. I have never seen those extreme symptoms to attend this disease, except in individuals who were greatly reduced by previous illness, or some other cause: they generally, but not always, prove fatal. Several recovered during the epidemic in 1841, and within the last two months I saw a very well marked case of it, which recovered under Dr. Corrigan's care, in the Hardwicke Hospital.

The symptoms which attend the disease, as it generally comes under our notice, and which seem to distinguish it from ordinary pneumonia, are, that—1. The peculiar heat of the skin, so forcibly dwelt upon by Addison, as almost pathognomonic of pneumonia, does not exist; the skin is never very hot, sometimes dry, often cool, and even perspiring; but it very early acquires a peculiar *jaunâtre* aspect, which it retains throughout, and often does not lose for some time after all physical evidence of disease has vanished. This symptom was very strongly marked in several cases lately in hospital, some of whom are still under observation. 2. The cough is altogether different in character from that of ordinary pneumonia: it is very short, frequent, and performed without any apparent muscular effort whatsoever—very unlike the painful and distressing cough so often witnessed in vesicular pneumonia. 3. There is seldom any expectoration; when it does occur, it is not viscid, nor homogeneous, nor tenacious. 4. There is seldom much pain in the side; never the acute, stabbing pain which occurs in vesicular pneumonia from the pleura being implicated, because we rarely find pleurisy existing in this form of disease, and, as we remarked before, we often find the patient refer the pain which he does complain of to a part of the chest where we have no other evidence of disease existing. 5. The high fever which attends vesicular pneumonia is absent; the pulse is seldom remarkably fre-

quent; it is always feeble, and soon acquires a peculiar jerking feel, which it owes to the tenuity of the blood. The patient has frequently a listless and careless manner, and appears unwilling to speak even about his illness. Such was the case in a boy, about nine years of age, who was admitted into the Hardwicke Hospital, on June 5th, with solidification of almost the entire of one lung; yet neither he, nor his parents, who came with him, mentioned any one symptom from which such disease might be inferred. The prominent symptom for which they requested relief was constant vomiting. In some cases the pulmonary affection is accompanied by an attack of herpes labialis. There is always complete loss of appetite for solid food, but often great thirst; considerable modification of the voice often exists, amounting in some instances very nearly to aphonia; there is sometimes restlessness, and often insomnia. The physical signs are very constant: there is a dull sound on percussion over the affected portion of the lung, or lungs, and at first very feeble respiratory murmur, which, however, maintains somewhat its vesicular character, but soon becomes very decidedly bronchial. The peculiar crepitus of vesicular pneumonia is never audible. If the patient recovers, the progress of the physical signs is very remarkable; sometimes within twenty-four hours the extreme bronchial respiration and bronchophony are replaced by a feeble or even ordinary vesicular murmur, proving that the air-cells merely suffered obliteration from pressure, which, being removed, they again expanded.

The patient seldom dies in this stage: when he does, it is generally found that a very great portion of the lungs is engaged in the disease; they are very tough and heavy, and a section of them exhibits an uniform light gray colour. But the progress of this affection is very rapid (it seldom extends over a period of weeks, like some cases of vesicular pneumonia, which have passed through all its stages), and the lung seems readily to pass into a condition somewhat allied to gangrenous degeneration. Effusion now takes place into the bronchial tubes, and the patient dies asphyxiated. Post-mortem examination usually shows the lung to be of a dirty gray colour: there is no well-marked suppuration, but a species of general softening, and commencing decomposition.

Perhaps one of the best marked features of this disease is, "its not being amenable to any of the usual modes of treatment." I need not here allude to the more than inefficacy of abstraction of blood in any form to meet its requirements. The treatment by tartar emetic is equally inapplicable; and the mercurial plan of treatment, as it is termed, is also powerless to control this formidable affection. The treatment by the internal use of oil of turpentine, so advantageous in the suppurative stage of vesicular pneumonia, does not appear to have any influence on this form of disease. Wine and the usual diffusible stimulants support the patient's strength and add to his vital energy, and so are of use, but they seem to have no specific power over the

disease, such as is evidently exercised by the sulphate of quina. During the last eight months I have treated with quina all the cases of this form of pneumonia which I have witnessed, and I have had the opportunity of observing several cases similarly treated by Dr. Corrigan in the Hardwicke Hospital. On the 19th of April last Dr. Corrigan presented to the Pathological Society a specimen of this form of pulmonary disease, when he took occasion to allude to the efficacy of quina in its treatment. The result of this treatment has been that, of the cases which came under observation before effusion had taken place into the bronchial tubes, none proved fatal; while some few recovered, even after the lips had become blue, the face congested, and mucous râles were audible in the bronchial tubes.

The beneficial effect of quina in the advanced stages of pneumonia, when the patient is old, and the constitution debilitated, have long since been recognized; and we occasionally find authors alluding to the use of this drug as indicated by, or as a remedy for, some one particular symptom; thus Dr. Todd says:—"In the decidedly typhoid cases, I need scarcely say that the free use of stimulants is of essential service, and it is often of immense advantage to give quina freely, the special indication for this latter drug being profuseness of sweating." And Dr. Morehead, in his recent work on the Diseases of India, recommends the use of quina in pneumonia "characterized by its coexistence with fever of remittent type;" and Professor Wood recommends "the addition of sulphate of quina when hectic symptoms appear." But the advantages to be derived from the early use of this medicine in this particular form of pneumonia have not been sufficiently dwelt upon. The average dose administered was five grains every three hours (in a few very severe cases ten grains were given for the first dose); in some instances it was deemed advisable to continue its use in this quantity for several days; yet in no instance did I observe any untoward result to arise. The first indication of recovery was, in general, a marked alteration in the character of the pulse, which also decreased in number; while, as to physical signs, the rapidity with which the bronchial breathing and extreme dulness disappeared from an entire lung, or portions of both, was truly surprising. It was not found necessary, or deemed advisable, in any instance to precede its administration by the use of a purgative or emetic, as advised in other instances. In the case of Leonard, nine years of age, who was admitted with vomiting, I at first hesitated, but the symptoms of the disease were so well marked, and the entire of one lung was so deeply engaged, that I ordered it to be given in two-grain doses every three hours; after the third dose the vomiting ceased, and did not recur; and on the fourth day the boy was convalescent.

And, if the pathology of this disease be such as I have endeavoured to describe, the treatment by quina is that from which, of all others, we should naturally expect the greatest advantage. The action of quina "is exerted primarily in the blood (Headland), and not on the

nerves:" Tiedeman and Gmelin found it long ago in the blood of a patient to whom it was administered; and Cochran, in a late number of the 'Charleston Medical Journal,' points out in what its action consists by detailing its effects on the uterus. He says:—"In women, under its influence, if they were menstruating, they complained of increase. In some cases it hastened the flow if given just before the period; it provoked their return when suddenly suppressed by cold, &c. An important circumstance connected with the action of quina, and which may throw some light on its mode of action is, that, if administered in large doses, and frequently repeated, it defibrinates the blood, rendering it fluid and incoagulable; this fact has been clearly established by the experience of Baldwin, Melier, Briquet, and other respectable authorities."—*Dublin Quarterly Journal, Aug.* 1856, *p.* 95.

12.—CASES AND OBSERVATIONS ILLUSTRATIVE OF THE CONNEXION BETWEEN PNEUMONIA AND RENAL DISEASE.

By Dr. B. G. M'Dowel, A.B., Physician to the Whitworth and Hardwicke Hospitals, Dublin.

[The coexistence of certain suppurative inflammations with chronic renal disease, but more especially the combination of the latter with the suppurative and gangrenous forms of inflammation, occurs too frequently to allow us to regard it as a mere coincidence. The reasons which have led us to this belief are:—]

1. That when pneumonia occurs in connection with renal disease, it has a remarkable tendency to assume the suppurative or gangrenous form; and 2. That we are to regard the morbid condition of the kidney as the predisposing cause of these very fatal terminations of a disease which otherwise terminates favourably in the vast majority of instances.

[At a recent meeting of the Pathological Society (January 19, 1856), the following observations were made in reference to this subject:—]

Dr. M'Dowel particularly directed the attention of the Society to this combination of disease, and stated his belief that chronic renal disease had a great influence on the development of suppurative inflammations. This he had especially observed in pneumonia, as for the last eighteen months, during which period he had paid particular attention to this subject, *he had not met with a fatal case of suppurative pneumonia in which renal disease was not also found to exist.* His opinion was, that pneumonia, in the great majority of instances, passes through certain regular phases which naturally tend to a restoration of the healthy condition of the lung; but that when

pneumonia occurred in a person in whom renal disease had pre-existed, the tendency of the disease then was to assume the suppurative, or the gangrenous form.

[The evidence on which this opinion was founded were many cases which the author had met with of pneumonia running rapidly into purulent infiltration, with Bright's disease of the kidney. All these cases were very similar.]

In them we see pneumonia running a very rapid course, terminating fatally in from six to nine days, and death the result of a profound impression on the system generally, rather than of asphyxia; for, as a general rule in these cases, dyspnœa was not even complained of; as if the nervous influence was so much lowered, or overpowered, that animal sensibility had become almost extinct. The condition of the kidneys was likewise very similar in all, being large, soft, and pale, and the seat of some adventitious deposit, which, more or less extensively, replaced the normal structure. In one case only was a different condition found to exist, and in it the kidney was sacculated or multilocular, and contained much pus. As it is usually met with, pneumonia is a disease which naturally tends to recovery, and which I can confidently state requires no heroic treatment to subdue it; but when it occurs in connection with an unsound condition of the kidneys (being *dependent*, it may be, on such condition), we are presented with a totally different form of disease, and one which too often will terminate fatally, notwithstanding the best directed treatment. And it may be deserving of future investigation to inquire, whether the danger which so notoriously attends "typhoid pneumonia" may not be found to depend upon the fact, that this form of disease is developed as the result of some constitutional fault, which, when traced to its source, may be found to originate in renal degeneration.

Direct evidence, I think, has now been furnished of the influence which renal disease exercises on the course, duration, and result of pneumonic inflammation, and especially of the tendency of pneumonia, under such circumstances, to pass into suppuration. On the other hand, if in fatal cases of pneumonia, in which suppuration had not occurred, the kidneys were found healthy, we should have an additional argument in support of this opinion; but as pneumonia rarely proves fatal unless suppuration has first occurred, this evidence is more difficult to be procured; it is furnished, however, by the following case.

Case.—Pleuro-pneumonia. Death from suffocative Catarrh on the thirteenth day. No Pus in the Lung. Kidneys healthy.—John M'Kenna, aged 60, was admitted into the Hardwicke Hospital, under Dr. M'Dowel's care, June 5, 1851. The day before, he was attacked with shiverings, headache, and pain in his left side, accompanied by such lassitude that, to use his own expression, "he was knocked down by it at once;" although he was so short a time ill, he was ex-

tremely weak. The chest was carefully examined, but only some bronchitis on the left side could be detected. Pulse 100, and compressible. He was ordered camphor mixture, with aromatic spirit of ammonia. His condition remained the same until the 8th, when he became much morse; he raved, and had become much weaker. Pulse 88, weak and intermittent. The lower half of the left lung was found to be solidified; the lower half of that side of the chest was dull to percussion, and over the same extent the vascular murmur was replaced by tubular breathing. Bronchitis existed to a considerable extent on the right side; expectoration scanty, viscid, and lemon-coloured. To be dry-cupped extensively; a blister to be subsequently applied over the dull side; blue pill, carbonate of ammonia, and ipecacuanha in pill; wine, 8 oz.

12th. Is much improved. Pulse 56, and regular; crepitus reduced, and diminution of bronchial breathing on the left side.

Continued steadily improving until the 15th, when it was found that alarming symptoms had become suddenly developed. His lips were livid; there were extreme dyspnœa, and a cold, damp, condition of the surface; effusion had taken place into the tubes, and a loud mucous rattle was universally present. A large blister was applied between the shoulders, a mustard emetic administered, whilst wine was given liberally.

16th. No improvement; no emetic effect had been produced; whiskey and ammonia were given freely, but the patient gradually sank, and died the same night, being the thirteenth day of the disease.

Autopsy.—Right lung largely distended with air, and œdematous; much frothy serum exuding when incisions were made; bronchial tubes on both sides filled with a similar fluid; recent lymph effused on left pleural surfaces generally, but more especially in the region of the diaphragm. Lower lobe of the left lung completely hepatized; it sank in water, and was friable, but did not contain any pus. The heart was healthy; the kidneys were congested, but healthy.

The termination of pneumonia in gangrene may likewise be found associated with renal disease. In four instances, which have very recently come under my observation, this association of morbid conditions existed; but how far this combination of disease is to be regarded as the general rule, or its exception, must be determined by a more extended series of observations.

Case.—Pneumonia of the Left Lung, terminating in Gangrene. Fatal in seventeen days. Both Kidneys extensively diseased.—Eliza Champion, aged 28, was admitted into the Hardwicke Hosdital, under Dr. M'Dowel's care, December 31, 1855. On Saturday, the 22nd, had a severe rigor, followed, after three days, by cough and fetid expectoration. Two days after her admission she miscarried of a fœtus at the seventh month. On the day following, January 2nd, she was much prostrated, weak, and sunk. Pulse rapid and small; expecto-

ration copious, dark-coloured, thin, and fetid; bright circumscribed flush on each cheek; pupils contracted; cough very troublesome. Respirations 56; pulse 136; the breath was fetid. On examination amphoric blowing was found to exist over the greater portion of the back of the left lung; metallic resonance of the voice, and gurgling, were likewise evident; but there was no splash heard on succussion; whilst abnormal tympany, and the signs of excentric displacement, were absent. The diagnosis of a large gangrenous cavity in the left lung was not therefore difficult.

She was ordered eight ounces of wine daily, and an ounce of a mixture containing six drachms of syrup of bark, three drachms of solution of chloride of soda, one drachm of tincture of opium, and six ounces and a half of water, to be taken every fourth hour. Treatment did not seem to influence the progress of the disease; the expectoration became greater in quantity, and more and more offensive; soon it gurgled up from the throat with little effort on the part of the patient; presently, shreds of a stringy substance, like fragments of lung, were coughed up, and from this time the fetor became almost insufferable, yet the strength did not seem to give way much until the 8th, when diffused inflammation of the left parotid region appeared; then came rapid sinking, and death ensued on the following morning.

Autopsy.—The left lung was found in a state of absolute putrefaction; what remained of it hung in loose shreds, revealing a dissection of the tubes and vessels; recent lymph, contrasting by its white colour with the black mass beneath, lay in thick patches on the pleural surface. The *right lung*, which was nowhere solidified, was found studded with several gangrenous vesicles, from which, when they were cut into, fetid gas and grayish-coloured pus escaped, whilst the substance of the lung beneath was found deeply disorganized. The *kidneys* were symmetrically and extensively diseased; a section showed a great increase in the depth of the cortex, an adventitious deposit, absorption of the central cones, and an excessive deposition of fat towards the pelvis.

The order of the mordid changes in this case was, probably, the following: first, pleuro-pneumonia of the left lung, which rapidly passed into gangrene (owing, as I believe, to the existence of extensive renal disease); secondly, the gases thus generated were absorbed, giving rise to a putrescent condition of the blood; as the result of which we had, thirdly, cellulitis of the parotid region, and gangrene in isolated patches (not preceded by inflammatory consolidation) of the right lung.

Case.—My friend Dr. Hughes was present at the *post mortem* examination in the preceding case, and carefully examined along with me the condition of the kidneys: he mentioned that a very similar case, which had been under his care in Jervis-street Hospital, had died that morning, and kindly promised to investigate into the state

of the kidneys in making an examination of the body. The result was, that the kidneys were found similarly diseased. The gangrenous lung and the kidneys were made the subject of an interesting communication to the Pathological Society (January 12), and the details of the case will appear in the transactions of the society.

A similar case was brought before the Pathological Society by Dr. Corrigan at a subsequent meeting. There were gangrenous pneumonia and a diseased condition of the kidneys.

Case.—Gangrenous pneumonia, and disease of the kidneys.—This case occurred within the last few days. The patient was likewise under the care of my colleague, Dr. Corrigan, who kindly placed the notes of the case (which were taken by Mr. Barrington, one of our clinical clerks), and the results of the *post mortem* examination, at my disposal.

James Carroll, aged 60, a stone mason, was admitted into the Hardwicke Hospital under the care of Dr. Corrigan, March 14, 1856. The patient had been a dissipated and intemperate man. For three weeks before his admission he had been ailing, but was able to be at work until a week previously, when he was attacked with rigors and cough; his breath soon became offensive, and the fetor, he said, was observed by persons even at a distance from him; he had frequent cough, and spat up large quantities of brownish-coloured matter, which had a most fetid odour. At the time of his admission the man was evidently in a dying state. A coarse mucous rattle was loudly heard over the back of the left lung, which was dull to percussion. His lips were blue, extremities cold, and pulse so feeble as scarcely to be felt. He died thirty hours afterwards.

Post-mortem Examination.—The left lung was solidified from apex to base; superiorly it exhibited the appearance of gray hepatization, whilst inferiorly it was in a state of gangrene. The right lung was congested and œdematous, the kidneys were manifestly diseased, they were soft and enlarged, pale and mottled externally, and internally presented a confused marbled appearance, the distinction between cortical and medullary portions being, for the most part, entirely obliterated,

These cases (12 in number) constitute the evidence in support of the opinion, already several times expressed, that between pneumonia in its worst and most fatal forms, and structural disease of the kidneys, some definite relationship exists. If this opinion be adopted, and if we regard the combination of diseases illustrated by these cases, as representing parts in one great chain of pathological sequences, then the order of these sequences is easily traced out. It is no new doctrine that a diseased condition of the kidneys cannot long exist without an impairment, more or less serious, of the great function of excretion. A morbid condition of the blood is established as the result of imperfect depuration; hence arise certain secondary affections, of which (in connexion with diseased kidneys) serous inflammations and affections of

the brain and heart have attracted the most attention. But it is probable that the secondary affections which depend on organic renal disease will vary according to the stage of the disease, or according to the peculiar form under which it is manifested.

"Bright's disease," we now know, is a generic term which includes several dissimilar diseased conditions of the kidney; and, whilst inflammations of the serous membranes may be more frequently associated with one particular form of disease—viz., the small, contracted "granular" kidney—pneumonia in its worst forms (gangrenous or suppurative) may be more peculiarly the secondary result of the large, smooth, pale kidney, which was so uniformly found to coexist in the cases already detailed.

In these observations my object has been to avoid theorizing, and to furnish a simple statement of clinical facts; and I am perfectly ready to adopt or reject the opinions here advanced, as more extended observation may either confirm or refute them.

At another time I hope to be able to furnish some evidence of the influence which renal disease exercises on the development of pyemia in general; and, in fine, will very briefly state the conclusions which I think may naturally be deduced from the cases given in the preceding pages:—

1. That in fatal cases of pneumonia renal disease is very frequently found to exist.

2. That where such a combination of disease exists, suppuration of the lung will be very constantly met with.

3. That a similar morbid condition of the kidney is often found in gangrene of the lung.

4. Or, it may be conversely stated, that where pneumonia supervenes in a person, in whom renal disease has previously existed, it is very apt to assume the suppurative or the gangrenous form.

5. That pneumonia, when it occurs in such fatal forms and under such circumstances, is probably one of the "secondary affections" of "Bright's disease."

It has not been my intention to convey the idea that pneumonia has never been enumerated by authors as one of the complications of "Bright's disease;" though some writers are silent on the subject, others have distinctly noticed it, especially Rayer. But it will be found that the pneumonia described in this paper is of a different nature from that noticed by Rayer. The pneumonia which he describes as secondary to "albuminous nephritis" comes on at a late period, and after the dropsy and other symptoms of the renal disease have been fully pronounced; and hence he observes:—"The symptoms of such pneumonias are more or less marked by those of dropsy, or by the symptoms of cardiac disease, or other concomitant pulmonary lesions." In none of the cases above described was renal disease suspected to exist; all were apparently in the enjoyment of good health up to the moment of the sudden development of the pulmonary affection. Neither do the

cases of pneumonia, alluded to by Rayer and other authors (Bright, Gregory, Christison), resemble, in their anatomical characters, those detailed in the preceding paper. Suppuration and gangrene, either of which was found in all these instances, were not observed by any of these authors. One of Rayer's cases, however, is an exception to this statement—Case 38—in which external suppuration of the lung was found to exist. In the other two (for only three cases are given by Rayer in illustration) red hepatization and œdema, with engorgement of the lungs, were the principal morbid changes.—*Dublin Quarterly Journal, May*, 1856, *p.* 322.

13.—ON TETANIC SYMPTOMS CAUSED BY ANTIMONY; AND THE GREAT POWER OF THIS MEDICINE CROUP.

By Dr. John Elliotson, F.R.S., &c.

[The following cases will be found interesting on account of the importance which has recently been attached to antimony in the case of Cook, who died with tetanic symptoms, no doubt induced by strychnine, but to whom antimony had been previously administered.]

On the 3rd of April, 1850, I was requested by a medical gentleman, residing in Saville-row, to see the child, 14 months old, of a mistress-needlewoman in Prince's-street, Haymarket, labouring under a first attack of inflammatory croup, which he had been treating for three days with solely the potassio-tartrate of antimony. He had given 27 grains. His first dose was half-a-grain, and he stayed two hours repeating this and watching its effects till two grains had been swallowed, full vomiting excited, and relief obtained. He then left the house, directing that a tea-spoonful of antimonial wine—a quarter of a grain of the tartrate—should be given every four hours till his next visit, as long as the difficulty of breathing and croupy sounds were noticed. These returned repeatedly, but never so alarmingly as they had been previously; and next a dose of half-a-grain was administered continually, both day and night. By the fourth day, April 3, when 27 grains had been taken, the disease was very much alleviated: but the vomiting had been profuse, there had been tetanic symptoms, and the depression was extreme; insomuch that the gentleman, who had made long and repeated visits every day, became very anxious and desired my opinion. The arms and legs had been rigid, the former half bent; the hands and feet turned inwards; the thumbs drawn upon the palms; the head drawn backwards, and to one side; the jaw closed so that fluids could be introduced at the sides only, and with the forcible use of a spoon; and, though this condition was permanent for three days and nights, and after all vomiting had ceased, there were catchings of the whole frame, and every attempt to move the child had aggravated the spasms. Consciousness was never lost. When I first visited the

patient all those symptoms had subsided, the disease was greatly reduced, and debility was the chief point in the case. I said that such activity of treatment was new to me; that I had never given antimony to children under croup except in doses just sufficient to excite nausea and frequent vomiting; but that I had always been very unsuccessful in my treatment of such cases of strongly inflammatory croup, even with the addition of loss of blood and large quantities of mercury, which acted too slowly to have great power over the disease, though cases of a purely or chiefly spasmodic nature yielded for the most part readily; that I made it a rule never to interfere with treatment which was proving successful, notwithstanding it was new to me, and, perhaps, not in perfect accordance with my notions. The gentleman informs me that I gave a very decided opinion, that the child would recover, that the treatment had saved its life, and that if the symptoms of croup returned they should be combated again with the free, but careful, exhibition of antimony. I well recollect he told me at the time that he had feared I should oppose the further use of the medicine in any circumstances. The child recovered with no further treatment, and is now a fine boy nearly seven years and a-half old.

This gentleman was led to treat the case so freely with antimony, he said, by having once been successful in such a case with similar treatment put in practice unintentionally. He had lost three children in one family by croup; and one of these I attended with him, after Dr. Robert Lee had seen it, and I know that loss of blood, mercury, and antimony were carried as far as prudence justified. A fourth child, the youngest of all, was seized with inflammatory symptoms in the throat, while the eldest was being treated with antimony for its fatal croup. By mistake the youngest had the medicine intended for the eldest, and quickly recovered, after great vomiting and depression; symptoms of croup showed themselves ultimately, but very mildly. He remarked to his assistant that, when he had another case of croup, he would treat it with such doses of antimony as had proved successful in this instance. A year afterwards the same child had croup again, and, through the negligence of the friends in not giving the antimony as directed, was not so treated, and it died.

On February the 15th, 1852, I was summoned by the same gentleman to consult with him upon the case of a baby, 8 months old, affected with inflammatory croup for the first time; the child of a Welsh member of Parliament. Another child had already died of croup in Wales. He had been called up in the night, and had begun with half-grain doses of the tartrate, giving one dose every hour, and visiting the patient every two or three hours. He grew anxious, and we met in the afternoon. From my knowledge of his former case, I at once concurred in what he was doing, and advised a continuance of the treatment, carefully watched by him, as I knew it would be both night and day. Seven grains were given in sixteen hours; copious vomiting was produced; and tetanic symptoms excited as in the first case, but not so

strongly. I did not witness them. Recovery was rapid and perfect. No other medicine was given ; two or three leeches had been applied at the first, and a dose of calomel ordered, but without advantage.

The assistant of this gentleman is now in practice in Warwick-street, and three years ago called me in to see the child of a tradesman, in Regent-street, affected with croup, and being treated by him with the large administration of the potassio-tartrate of antimony that he had seen successful in the first case which I have described. He began by applying three leeches, and with the antimony gave 12 minims of wine of ipecacuanha and calomel. I first saw the child late at night, after the treatment had been going on for twelve hours. He had given at first a quarter of a grain of the tartrate every ten minutes, and, as vomiting was not induced, he soon gave half-a-grain. This speedily had the effect, and it was repeated as often as the vomiting had ceased for a time. The plan was persisted in for four days, and about 32 grains of the tartrate were taken : no tetanic symptoms, nor convulsions, were produced, and the child, though distressed, perfectly recovered. The little girl was 6 years old. He says that I was delighted, that we both regarded the cure as splendid, and that he afterwards effected exactly such another cure in a child 13 years of age, at Turnham Green, where he was then staying, and no spasms occurred.

I have no doubt that I have generally failed with tartrate of antimony in violent inflammatory croup, and some other inflammatory diseases of children, by not carrying the remedy far enough. Children have been reported to have sunk under it, and I had always feared to do mischief with it. Of the uncertainty of the antimonial powder, I thirty-six years ago gave ample proofs to the profession, and from that time have not used it. The tartrate is all that can be desired : by regulation of the dose, it may, like the steam-engine or elephant's trunk, be employed for the most delicate or the most powerful work.—*Med. Times and Gazette, July* 5, 1856, *p.* 7.

14.—POTASSIO-TARTRATE OF ANTIMONY IN CROUP.

[In support of the remarks of Dr. Elliotson on the great power of this remedy in croup, Mr. W. S. Meek, of Tarporley, Cheshire, gives the following cases, out of the very many others in which he has employed it, in almost incredible doses, with very great benefit :—]

1852, March 28th.—J. T., aged 4 years, a healthy, robust child, had been suffering from inflammatory croup about eleven hours before I saw her, and the case seemed almost a hopeless one. I gave her immediately one grain of tartarized antimony, and covered the thorax with flannels wrung out of hot water. I repeated the grain-doses of antimony every hour for four hours, and afterwards gave her half a grain every six hours. In two days the child was comparatively well, only suffering from great prostration.

1853, May 2nd.—I was sent for to see a little girl, aged 7 years.

Symptoms of croup had set in in the night; her countenance was anxious, and she seemed much distressed. I gave her one grain and a-half of antimony, and applied the hot flannels; in an hour I gave her one grain, and repeated it every four hours, afterwards reducing the dose to half a grain every six hours, which was continued for two days; on the fourth day she was so much relieved, that my attendance upon her ceased.

1852, July 6th.—W. C., an infant, 13 months old, was attacked with inflammatory croup: he was a delicate child. I gave him half a grain the first dose, and repeated it in an hour. He afterwards took a quarter of a grain every six hours for twenty-four hours, and soon recovered.

I am in favour of giving a large dose at first, as it generally makes a decided impression upon the progress of the disease, and regulate the doses afterwards, as symptoms present themselves. I believe when you administer tartar-emetic, and follow it up, that leeches are contra-indicated, as the depressing effect the antimony has upon the system is quite sufficient to combat the inflammatory action going on. The only objection I have in giving large and repeated doses of the potassio-tartrate of antimony, especially to children, is, that it is not got rid of in the system for many days, after its use has been discontinued, and I feel convinced that its complete elimination does not take place so speedily as is generally supposed.

[Mr. J. Hartley, of Howden, bears testimony to the remarks of Dr. Elliotson, on the wonderful efficacy of the potassio-tartrate of antimony, when perseveringly and judiciously administered in inflammatory croup, he says]

For the last fifteen years I have adopted the practice of treating every case of croup with full doses of this remedy in combination with powdered ipecacuanha; and in no instance has it failed, unless the disease was very far advanced.

It would be absurd in the extreme were I to entertain any doubt respecting the production of tetanic convulsions from the use of large doses of tartar emetic, as stated by so high an authority as Dr. Elliotson; but I have never, in one instance, observed those symptoms. The prostration, in many cases, has appeared alarming, leading to the supposition that the remedy might be worse than the disease; and though there might be great risk in using such bold treatment, the severity and danger of the attack must always justify its adoption.

A few months since I was called to a little boy, 4 years old, apparently beyond all remedy. There was extreme difficulty of breathing; in fact, he could scarcely breathe at all, and then with loud croupy sounds; the features suffused and livid. I thought it impossible the child could live an hour. Six leeches were immediately applied, and he was placed in a warm bath, and an emetic powder given, composed

of 2 grains of the potassio-tartrate of antimony and 5 grains of powdered ipecacuanha, in half a teacupful of water. Vomiting was soon induced, without any apparent relief. The emetic was repeated in the course of an hour; and though the vomiting was not so severe, it produced profuse perspiration, and the relief obtained was most obvious. The crowing sound had in a great measure ceased, and the breathing became more free. As the bleeding still continued, he was allowed to remain quiet and free from medicine for three or four hours; but the symptoms reappearing, I again had recourse to the same treatment. A grain of the antimony, with two of ipecacuanha, was given every three, four, or five hours, as the symptoms varied. He continued gradually to improve, and in two or three days had so far improved as to allow me to discontinue my visits.

Last year I was called to the son of a labourer in the country, 18 years of age, who was suffering from the most severe attack of inflammatory croup I ever saw. The croupy sound was so loud that I heard it some yards from the house. I found the patient sitting on the side of the bed, breathing most laboriously, and unable to speak, with great constriction across the throat. Twelve leeches were applied, and a powder, with 3 grains of potassio-tartrate of antimony and 5 of powdered ipecacuanha. He soon became nauseated, and after vomiting very freely he said he breathed more easily. A mixture was then ordered, with 25 grains of powdered ipecacuanha and 6 of tartrate of antimony in 6 ounces of solution of gum-arabic, two tablespoonfuls to be taken every three or four hours until visited again. I saw him in six hours, and found him much relieved, but much weakened. The medicine was then given at longer intervals, the symptoms gradually subsided, and on the following day little or no signs of croup remained, and he soon rallied from the consequent prostration. I could relate many other cases, did it not occupy too much of your space, all of which have yielded to the prompt use of this preparation of antimony with ipecacuanha. I believe the frequent exhibition of large doses of tartar emetic the only sure mode of combating the rapid progress of so fatal a disease as inflammatory croup. I have never seen any evil consequences from its use, except great prostration at times, which is always surmounted by a mild, though very nutritious diet.

[In reply to Dr. Elliotson's communication, Mr. Prior, of Tewkesbury, says, that as the result of extensive experience he can testify, that if such heroic practices be carried out the deaths from this cause would be immensely increased.]

Surely, if any fact in medicine is well established by fatal experience, it is that antimony, like opium, must be either discarded or used with excessive caution among infants. I should myself be sorry to witness the tetanic symptoms, caused in a child 14 months old, by 27 grains of tartar emetic given in three days; such symptoms would in most cases end, I feel sure, in death.

I do not believe twenty cases of inflammatory croup treated homœopathically, or left to themselves, would end more fatally than twenty cases so treated, even if they had the advantage of not having croup as well as their medicine to contend with. I observe that, at about the same date, Dr. Elliotson gave evidence in the case of the medical attendant at Surrey Asylum, "that the patient, to the best of his belief, died of the combined effects of a shower-bath and 1½ grain of tartar emetic;" so that, as a *reductio ad absurdum*, 1½ grain half kills a strong man, while 27 grains in three days save the life of a 14 months old child. I respect the great experience of Dr. Elliotson; but the landmarks of medicine must not be speculatively removed; nor without a great mass of authority must the comparatively safe ipecacuanha be replaced by antimony, one of the most potent of sedative poisons.—*Medical Times and Gazette, July 12th and 19th, pp. 46, 70; and August 16th*, 1856, *p.* 178.

15.—ON THE ABORTIVE TREATMENT OF HOOPING-COUGH.

By Dr. P. J. Hynes, Nottingham.

[The origin of this disease is still a mystery, but from the acknowledged effects of tonic treatment, such as quinine, change of air, &c., we are disposed to classify it among the neuroses. From the bronchitic symptoms that manifest themselves in its early stages, and the fact that the system seems only once in a lifetime susceptible to its influence, it appears to possess some analogy to the exanthematous tribe of diseases; but it differs very much from them in its irregular indefinite course, and the uncertain time of its duration. Dr. Hynes says]

Many years since, having spent a short probationary period with an apothecary in the west of Ireland, I found that, for the cure of hooping-cough, "in reputation he was *solus*," that "his fame through all the country raised his name;" numbers from a distance flocked to him whenever the disease became prevalent in any neighbouring locality. His *methodus medendi* he never imparted to any of his pupils; we were enabled, however, to notice a constant drain upon the bottle which contained the tincture of cantharides, and the fact of many of these tender patients suffering from symptoms of strangury, was convincing evidence that this potent drug formed the chief ingredient in this much-prized nostrum. About the period to which I allude (1834), there was published 'A Translation of the Dublin Pharmacopœia, with Observations, Clinical and Practical,' the conjoint productions of Professors Barker and Montgomery, whose names and well-known character for accuracy in their respective departments of knowledge, stamped their writings with great value. Dr. Montgomery therein informs us, that tincture of cantharides "has been administered in hooping-cough, and in one case of which I was

informed, with great success. It was thus given to an infant:—Tincture of bark, half an ounce; tincture of cantharides, three drachms; compound tincture of opium, half an ounce. A tea-spoonful to be taken three times a day in a table-spoonful of linseed tea." This remedy, then, or a modification of it, I have been in the habit of employing in cases of pure uncomplicated pertussis, and invariably with the effect of cutting short the disease after a few days' persistence in the treatment; the strangury which it induces must be kept up in a mitigated form for some days, and never more palpably did chlorosis fall before the power of that admirable remedy steel, or discharge in gonorrhœa become suspended when the system of the unhappy sufferer becomes the subject of some more potent constitutional malady—upon the principle laid down by Hunter, that both diseases cannot coexist —than that the painful paroxysms of hooping-cough shall gradually decline, and in a few days cease altogether, by a careful and gentle maintenance of strangury, from a persistence in the use of cantharides. I at first order for my patient a gentle emetic of ipecacuanha powder, give one or two active aperients, place him or her, as the case may be, on a non-stimulating diet, and then commence the foregoing remedy. I likewise combine with it the use of an empirical remedy, the well-known Roche's embrocation; but this is, perhaps, from some prejudice as to its efficacy from having tried it, rather than from claiming for it any superiority over any other plan of counter-irritation; indeed, as a general rule, I have a great aversion to such nostrums, but this seems to have acquired and maintained its position, so as to meet with the sanction of its employment by men of the highest professional standing, who do not go to the extreme length that a celebrated Yorkshire baronet did, whose devoted loyalty made him spurn at a certain *radical* cure for the gout, to which he had been a great victim, but which same remedy he swallowed with extraordinary avidity when informed of its *sovereign* virtues.—*Lancet, July* 10, 1856, *p.* 87.

16.—ON APNŒA AND ASPHYXIA.

By Dr. Marshall Hall, F.R.S., &c.

Before we can be perfectly prepared to investigate the nature of apnœa, its effects, and its remedies, we must study the special function which is interrupted.

Respiration involves *four* important processes:

First. Oxygen is *absorbed* by the blood circulating in the pulmonary blood-channels,—only absorbed,—from the *in*spired atmospheric air.

Secondly. By this oxygen the carbonic acid is displaced and evolved from the blood, and removed from the system with the *ex*pired air.

Thirdly. Aqueous vapour in large quantity is evolved from the pulmonary blood, and exhaled with the same expired air.

Fourthly. The expired air has a higher temperature than the inspired air; caloric is therefore given off by the pulmonary blood, the

temperature of which is *pro tanto* diminished; respiration is therefore a *cooling process.*

The trachea is not only the way of ingress into the lungs, but the way of egress from the lungs; it is not only the ventilator by which the atmospheric air, and especially its oxygen, are admitted, but the chimney by which the air expired is, with its accession of carbonic acid, conveyed from the lungs,—that carbonic acid which would, if retained, be a real "*choke-damp*," as it is the blood-poison, and the real cause of death in apnœa.

The important function of respiration consists in this inhalation of oxygen and exhalation of carbonic acid. This function is unattended by any important change of temperature. Animal heat is evolved *not* in the lungs, *but* in the general system at large, where the change of oxygen into carbonic acid, the slow *combustion* of carbon, takes place, during the processes of deposition and absorption, in which nutrition consists.

That nutrition, and with it the evolution of heat, are events which occur in the systemic circulation, are facts principally established in modern times; but not entirely; they were not unknown in the time of Harvey. I find the following remarkable passage in a 'Discourse' appended to his English edition of Harvey's 'Anatomical Exercises concerning the Heart and Blood,' by Dr. James de Back, which appeared in the year 1653, p. 107:—

"I doe believe, that wherever nutrition is performed, there this function is most manifestly executed, and that the parts, whilst they are nourished, are heated; there the composition of the blood is dissolved, and is divided very small; there also the firie particles, freed from their fetters, and being united, do show their force by heating."

That the function of respiration is in reality a cooling process was the doctrine of Galen (*De Utilitate Respirationis*, ed. Ven. 1597, p. 223.) It was also the doctrine of Haller; and it is obviously true. We may inhale the atmospheric air at various temperatures, some of which are far below that of freezing water; we exhale it at the temperature of 92° or 94° Fahr.—a temperature comparatively higher even in summer, and still more considerably so in winter. This elevation of temperature is effected by a proportionate loss of temperature sustained by the blood circulating in the pulmonary blood-channels. *Respiration* is therefore a cooling process.

I purpose, on the first opportunity, to introduce two thermometers, one along the jugular vein into the right auricle of the heart, in a breathing animal, the other along the carotid artery into the left,—under the influence of chloroform. The circulation of the blood is extremely rapid; still I think that a delicate thermometer, constructed for this purpose expressly, will detect a difference, and that the temperature of the left side of the heart, will not be higher, but lower, than that of the right.

We may thus recapitulate the matter: the oxygen inspired in the

lungs is absorbed, and thence conveyed by the arterial blood into the general system, and that it *there supports* the combustion of the tissues, by which combustion the animal heat is evolved; the carbonic acid, the choke-damp, the blood-poison, formed by this combustion, is re-conveyed by the venous blood to the lungs, and thence exhaled into the atmosphere.

If the mere absorption of oxygen be attended by the evolution of a slight degree of heat, this is probably counterbalanced by the simultaneous escape of carbonic acid, the one losing, the other assuming, the form of gas; so that the resultant temperature may be unchanged.

But the evolution of aqueous vapour must also be a cooling process in proportion to the quantity of water passing from the fluid state to that of vapour.

The cooling effect of the inhalation of a cooler and exhalation of a warmer portion constitutes then an obvious cooling process.

And here I may revert to that marvellous law of the animal economy, according to which the number and extent of the respirations and the rapidity of the circulation constantly maintain a due *ratio* to each other. During repose, and especially during sleep, these are both at a *minimum;* during activity and effort of every kind they are augmented. In both cases the physiological ratio or proportion between them is sustained.

A singular exception to this rule is observed in the dog, which pants and projects its tongue, as the effect of heat merely, I believe, without proportionally augmented circulation; the augmented respiration is merely a cooling process.

If the due ratio between the circulation and the respiration were broken, one of two events must occur: if the circulation be unduly and disproportionately augmented, or the respiration be unduly suppressed, the quantity of carbonic acid being unexhaled and therefore retained, the blood becomes poisoned and the patient destroyed; if the respiration were unduly augmented, the temperature of the animal would be lowered and the patient might die of *refrigeration.* The former fact obtains in every case of apnœa; it constitutes the death by drowning, strangulation, "choke-damp." The latter fact was actually produced in the splendid experiments of Legallois, in which he used artificial respiration. Undue artificial respiration cools and destroys; the *balance* of temperature is lost.

In treating the cases of apnœa and approaching asphyxia, these principles must be our guide: if we induce too full and too frequent respiration even, the patient will lose his temperature and be destroyed.

I have already said and proved that a disproportionate circulation is fatal,—that the tendency of the warm bath without respiration is deleterious.

If our attempts at artificial respiration be made inconsiderately,—if the induced respiration be too rapid or too great, compared with the remaining degree of the circulation,—we destroy our patient.

The warm bath, or any other measure by which the circulation may be sustained, *respiration being deficient*, is, I repeat, actually destructive. It cannot be repeated too often, that an animal dies of apnœa the more promptly, the warmer the temperature, the more active the circulation, in a word, from whatever cause.

Our object in treating the drowned patient must be twofold; to restore the respiration, but to restore it in a degree proportionate to the degree of the circulation; and to promote the circulation, in its turn, by any means in our power, again augmenting the respiratory movements as we may succeed in this second object.

These are precisely the two objects which I mentioned in my former communication. It is since that communication that I have ascertained the importance of sustaining a just and due *proportion* between the two functions, the circulation and the respiration, which it must be our constant aim to promote simultaneously and proportionately, either of these, without the other, being actually fatal. Physiology must be our guide. Empiricism has proved fruitless—nay, worse than fruitless; it has not even taught us, that to raise the temperature, without inducing effectual and proportionate respiration, is, as I have stated, destructive.

With the postural respiration formerly described must be combined the system of energetic frictions of the limbs upwards, with firm pressure, by means of which not only is the venous circulation *best* promoted, but the warmth itself is *best* restored.

These things, too, are accomplished by the bystanders, on the spot, without loss of time, therefore, and without apparatus of any kind.

Pocket-handkerchiefs should be used as towels, whilst each looker-on may supply some garment—the waistcoat, for instance—to lay under and over the patient, the face, neck, and thorax being, however, if the weather be not inclement, freely exposed to the breeze.

Nothing can be more admirable than the efficiency of postural respiration. Requiring no apparatus, it has solved the difficulty, which formerly hung over our efforts to save the half-drowned patient.

P.S. I beg to add, in a postscript, the sketch of an experiment recently performed, of which I propose to give more ample details in a future paper, which I am preparing on this interesting and important subject:

I placed one mouse in five ounces of atmospheric air: it died in *forty* minutes.

I placed a second mouse in the same quantity of atmospheric air, into which pure ammoniacal gas was diffused: it survived *ninety* minutes!

The difference between these two experiments is that of carbonic acid blood-poison, retained unchanged, and exhaled or neutralized.—*Lancet, July* 5, 1856, *p.* 5.

17.—ON PHTHISIS.

By Dr. James E. Pollock, Physician to the Hospital for Consumption and Diseases of the Chest.

The first stage of phthisis is generally stated to be that in which the physical signs indicate a deposit in the lung. But we must begin higher up; there are undeniably earlier *symptoms* than there are *signs*, and long before the ablest and most skilled observer can detect the sounds which indicate solidification, there is an antecedent state of disordered health which, as a causative agent, originates the altered state of blood, not merely predisposing to tubercle, but elaborating and preparing the material from which tubercle is to be formed and deposited in the lung. To this part of our subject I would entreat your earnest attention, and for it would bespeak your future study. It is not only the key to the pathological meaning of the disease, but it is the hopeful period for treatment—the critical time in which we may check the inroads of the most fatal of all affections incident to the human frame. If we are to wait till an unorganizable product of low vitality, and only decomposing chemical tendencies, is deposited in the lung, before we call the disease established, or begin to treat it, we are beginning at the wrong end, and looking for a remedy when the mischief is done.

From my own careful observation, and a minute questioning and examination of some hundred patients, as well as from opinions expressed by others with far greater opportunities, I feel no hesitation in saying, that the earliest symptom of tubercular disease is *wasting*. It precedes the cough and the hæmoptysis, and all the physical signs, and it is earlier in point of time than the hectic. Now, this wasting is peculiar, and recognisable; it is what gives the *phthisical aspect*. It is probably first manifested in the face and hands; it withdraws the fatty cellular cushion which gives the rounded appearance of health to the cheek, prominence to the eye, expansion to the brow and temples, and it thins the scalp. It lessens the pulpy cushion around the nails, and helps to club the fingers. Next, the muscular tissues waste; the legs and chest muscles fall away; hence the second symptom, *debility*, or diminished muscular power. The state of the skin here deserves notice; it is pale—not exactly the pallor of anæmia (for extreme anæmia may exist without phthisis, and is not frequently allied to it), but it is more than pale, it is relaxed and flabby; to the touch it is moist, to the eye dull in colour. Coincident with these symptoms there is the sense of *debility*—of something wrong; a feeling that vital powers are flagging, that nutrition is not active, that the waste of the living machine is more rapid than its repair. Hence the depression of spirits to which some attribute the origin of the disease, but in truth it is its consequence, although helping in its progress, for if nervous structure is not nourished, it will fail in its work, just as muscular fibre will fail; and with diminished

nervous power we all know how the emotions begin to master intellectual vigour, and the natural resistance made by vital energy to any debilitating attack. At this time, the secretions are natural; the urine not materially altered in specific gravity, but the amount of urea varies, and is probably below the natural quantity. I point attention to this, for perhaps it will be found that this diminution in the quantity of urea is invariable. Now, urea is one means of ridding the system of its waste material, but the *débris* of muscular waste is not poured out by this outlet. The liver acts as before; the bile is unchanged in character—it is not excessive, at least; there is no expenditure of the refuse of tissues in forming the constituents of *bile*. The time has not yet come in the history of the disease, when the decarbonization of the blood is impeded by the obstructed lung, and thrown on the liver; consequently, bilious disorder, or altered hepatic structure, are not common in the early stage of phthisis. The primary acts of digestion, forming, as they do, a peculiar vital function, with chemical actions which are exceptional in the animal economy, are generally well performed. If appetite flag, it is for want of the vital and nervous power which so peculiarly governs the desire for food; the *capacity* of digesting is there, unimpaired, and so it often is found to the last hour of life in this disease. Occasionally, however, acidity is a symptom met with, and it were wrong to omit this, for it has been stated that some precepitation of the albuminous material from the blood takes place from this excess of acid; but it cannot play a very important part in changes which are far more deeply seated in the system, many steps further on in the conversion of aliment into tissue.

The first indications of febrile disorder are now manifested. The pulse is accelerated, not to a uniform, high standard, but at intervals. It seems as if the altered *quality* of blood had become possessed of irritative qualities, and so excited an irregular and occasional action of the heart, or were sufficiently stimulating to maintain an unvarying, vigorous contraction of the ventricles, and the elasticity of the arteries; hence the occasional palpitation and the flushings. The febrile chill and sweats are now very often present—the chill short, the perspirations long—the converse of the malaria febrile paroxysm.

Now, I wish it to be clearly understood, that all this may occur *without any physical signs* of deposit in the lung, without any cough, without any hæmoptysis. It is only to those who are intimately conversant with chest auscultation that this fact will be recognisable and evident, but it is so. Those who specially study chest disease are accused of over great refinements in their description of the earliest physical signs of phthisis, and they are often disbelieved by others with less practised ears. They are therefore at least little likely to overlook the dull percussion-note, the deficient inspiration, the prolonged expiratory murmur, or any of the other reputed earliest signs of a deposit of tubercle in the lung; yet those most practised

in auscultation, and most anxious to register the faintest indications of solidification in the pulmonary tissue, will fail to detect any one abnormal sound in the chest at this period. The sweats of which I have spoken are often excessive—the waste of the system seems to find an exit here, and the loss of weight is often very remarkable, and very rapid. Coincident with these symptoms, there may be others very important when they exist, but are not uniformly present, and which indicate a deep disorder of the blood itself. Such are purpura and mucous hemorrhages. A remarkable case of this kind, which I have watched very carefully, and in the treatment of which I have been assisted by my colleague, Dr. Hamilton Roe, will illustrate some of the leading features of this stage.

A. B——, a gentleman aged 48, six feet three inches in height, well made, wide chest, erect gait, good muscular development; looks some years younger. Parents and collateral branches of his family free from chest disease; one sister has been for years affected with chronic phthisis, and is still living; one daughter has been more recently attacked by the same disease, and now exhibits the symptoms and signs of softening tubercle. This gentleman led an active, regular life, took much exercise on foot, often in the country, and spoke in public at least twice a week. For the year preceding February, 1855, he had complained of unusual fatigue on exertion, and though of unvarying cheerful disposition, he often looked and felt fagged. For two previous years I had remarked in him the gradual formation of arcus senilis, which is now a perfect ring. In the spring of 1855 he rather suddenly got much weaker, felt unable to take his usual Saturday's walk in the country, and began to lose flesh rapidly, his face looking worn, and the calves of his legs becoming flabby. He said to every one that he felt very ill, but could not tell what was the matter with him. His appetite became indifferent, but he continued to live well, and took three glasses of wine daily. He had no cough nor expectoration, no pain nor dyspnœa; his urine was natural, or rather paler than natural, and its specific gravity of rather a low standard; his pulse was rather small, and averaged 85. Slight chills then occurred, and *sweating* began to some extent. His chest was normal; there were no physical signs whatever. In June he left for Ireland, but got rapidly worse, and when there his legs became spotted with purpura. For this he took mineral acids, but becoming alarmed he returned to London in July, very weak and much exhausted. At this time I met Dr. H. Roe in consultation. The sweating, debility, and purpura were the leading symptoms. He had slight nausea, and a whitish tongue (of chronic dyspepsia). A careful examination of the chest showed only that (as we thought) there was a general diminution of the healthy *tone* of the percussion note, but this was not localised; it was not more apparent under the clavicles than elsewhere; it was the single sign which we could detect. At this time he began to have slight, dry cough, and some dyspnœa. By

Dr. Roe's advice he took one grain of tartar emetic every six hours for two days, remaining in bed and taking broth nourishment. The first two doses produced violent vomiting; the rest were tolerated. We sent him to Germany, and gave him an unfavourable prognosis of the case, as he was rapidly losing flesh. He went to Homburg in July, 1855, and shortly after removed to Schwalbach, and contrary to our advice (which reached him by letter too late), he took a course of the powerful chalybeate waters, and bathed daily in a mineral bath of about 84°. In the beginning of August I accompanied a patient to the Rhine, and wrote to this gentleman to meet me. When I saw him I was shocked at the change in his appearance. He was wasted to an extreme degree; his features fallen away; his legs so thin that he could scarcely walk. He had that peculiar feeling of weakness and pain across the sacrum, which indicates, when chronic, a high degree of vital exhaustion. The sweating was profuse, wetting a mattrass every night, so that he was obliged to use two beds. The cough was not severe, but was worse than formerly; it was short and dry. He had no expectoration, and never had hæmoptysis.

A very careful examination of the chest gave the following results.—There was slight dulness, rough and deficient inspiration, expiratory murmur prolonged, and a sensible amount of vocal resonance over the apex of the right lung—signs which were slight, but had not been observed before. The aspect of the case was very bad; and I advised his instant return to England. I ordered slight counter-irritation to the right chest, cod-liver oil, a light alkaline tonic, and gallic acid, every night. He did not return to England, but went to the banks of the lake of Luzern, in Switzerland, and lived on milk. From this time he improved daily, and after five weeks he returned to England. To my surprise, and that of Dr. Roe, he had gained flesh remarkably; the sweating was much less, his strength was vastly improved, and his spirits had risen. He had still slight cough and dyspnœa. The physical signs reported above *were the same*, and were verified by Dr. Roe. From that time to the present he has sensibly gained strength and improved in health. *He is not the same man he was before*, and cannot walk so far as formerly. The sweats have long since ceased; he has no cough nor dyspnœa, and he looks in perfect health. His weight is within a few pounds of his former healthy standard. A very careful recent examination (in March, 1856) *has failed to detect any physical signs whatsoever*.

Now this case seems to me to be a remarkable illustration of the blood-changes which precede the formation of tubercle in the system, and of the constitutional disorder which is symptomatic of such a state of health. I will not say that you will meet with many such cases, nor do I desire to record it as anything more than a *type* of the blood-disorder which often leads to tubercle. I beg your attention to the sequence of the symptoms. The *wasting*, as a primary symptom, the resulting debility, the succeeding sweats, the hemorrhage under

the skin indicating serious blood disorder, and relaxation of the capillaries, the rapid and extreme emaciation—all without physical signs of deposit in the lung up to a certain stage; then the well-marked signs of slight consolidation of the pulmonary tissue, coincident with cough and dyspnœa. The recovery is also very remarkable; but not without parallel, as I shall show. The question here arises, was this a case of phthisis? and speaking with diffidence when we have no opportunity of verifying the reply, I would answer, that in its history, its progressive symptoms, and its physical signs, we are bound to regard it as such. But can any amount of deposit of tubercle in the lung be ever completely removed? This is a question of deep importance, and demands a few observations.

The cure of phthisis, in its first stage of deposit in the lung, must depend upon two primary and coincident conditions. First, on a cessation of the blood disorder which has given rise to the formation of tubercle, a cessation of the constitutional state of health; and next, on the nature of the deposit in the lung. Where the latter is of the form resembling the purely strumous matter seen in the external glands, it may probably be resolved, or absorbed, just as we so often see take place in the cervical and other glands. If there be *identity* between the two deposits, as many believe, or even a strong *analogy* only, there is no reason, *à priori*, to doubt the possibility of a removal of strumous deposit from the lung any more than from the glands. But, again, where the deposit in the lung resembles rather the plastic result of inflammation than the slightly organised grey tubercle, it may be resolved by a process similar to that by which a pneumonia is removed.

There is also a form of tubercle which tends to cretifaction, and is expectorated in chalky masses, or as a horny matter; and being got rid of, leaves the lung sound. In these two cases, cures of the tuberculous deposit may occur, and they belong to the class which my colleague, Dr. Thompson, has lately dwelt on from this place, which are characterised occasionally by wavy inspiration, and which, when persistent, are "*slow* consumption."

[We have seen that, in some cases, tubercle in the lung seems capable of removal, arguing analogically, and we must now inquire whether such cases do occur in daily practice and are recognizable. Dr. Pollock believes, from his own experience, and the opinions of our most eminent physicians, that the constitutional and local disease may entirely disappear and health be restored. Numbers of people around us are constantly undergoing slight attacks of tubercle ending in recovery, and we shall find that one remarkable character of tubercle is its appearance in successive deposits.]

In answer to the question—whether the physical signs of disease are ever wholly removed in the first, or stage of deposit,—I would quote the following case, which occurred in my own practice, and was

frequently seen and examined by one of the most eminent chest pathologists, Dr. Stokes, of Dublin.

C. D. was a young lady, aged twenty-two, of delicate habit; had dark hair and eyes, and a well formed chest. A very distressing affliction occurring suddenly threw her into a depressed state of health. She lost flesh, and had slight cough, and a florid hæmoptysis to the extent of some ounces took place. The physical signs, as observed by Dr. Stokes, were a marked dulness of the percussion note over the left apex, and deficiency of respiration in the same spot. She was cupped over this spot, and in the course of a few months the physical signs vanished, the cough ceased, and she partially regained flesh and strength. After some months, a second attack occurred, exactly similar to the first in *symptoms and physical signs*, and was treated in a similar way, and again the chest appeared on examination to be clear of any deposit. She was then sent to travel in Italy. I may here remark that every case selected by Dr. Stokes for foreign residence was carefully chosen, the absence of fever and of active signs of progressive disease of the lung being essentials before he sent invalids abroad. I received charge of the case in Rome, in 1843, by letter from Dr. Stokes. When I first saw her, she was free from fever, was in tolerable flesh, had a very slight cough, and there were no physical signs of disease. But I had an opportunity of seeing one of these attacks. She had again a florid hæmoptysis (about four ounces), and over the same spot the percussion note became dull, and the respiration rough and deficient. By treatment, cupping and rest, she again rallied and the chest became clear. On her return to Ireland, I had an opportunity of meeting Dr. Stokes about this case, and received from him the above history, which was not unexampled in his experience. I may add that this lady died of phthisis about four years later.

I will only trouble you by mentioning a case which can surely be paralleled in the experience of all of us:

E. F. was, in 1839, attacked by slight cough, after unusual application to study. He had previously lost flesh, appetite, and strength, and began to be slightly feverish. After some increase of cough, he expectorated several small, hard cretaceous matters, and soon after regained flesh and health and lost his cough. He is now (seventeen years later) actively performing his duties as a clergyman, and is in very fair health, having no symptom of chest affection.

I have traced with some care and minuteness the first warnings or threatenings of the tubercular disease, as evidenced in a disorder of the system before any deposit has taken place in the lung, because this stage is of the highest importance, when viewed either with regard to its purely pathological or its curative import. I should be far from saying that every case is so strongly marked as the one which I have selected as an instance, for in certain cases the blood disorder is so rapid, the dyscrasis (as it has been termed) so sudden, that the local

signs and the general symptoms are almost coincident ; yet, as in by far the greater number of instances, the disease is of the slower and more insidious character, it may almost be affirmed that a diligent and informed seeker for the preceding constitutional derangement, would, if opportunity allowed, be rarely unsuccessful in detecting evidences of its approach.

The stage of deposit in the lung, long called *the first*, gives equal evidence of systemic disorder, which now, for the first time, becomes recognisable by physical signs. The acute invasion of an extensive portion of the lung by tubercle is rare, but it is met with in practice. It occurs in those strongly predisposed by hereditary taint, and more commonly in the young. It may be fatal without a single chest symptom except dyspnœa, and in such cases so clearly evidences a lesion of the most intimate vital functions on which the nutrition of the body depends, that I think it worth while to record one case of it here.

G. H., aged seventeen, a delicate-looking lad, narrow and shallow in the chest, came to Rome with his family, to pass the winter. His parents had left England for the health of a daughter, declared to be consumptive, and had already lost three or four children by tubercular disease. This boy was apparently perfectly well, and his state of health had never excited uneasiness. He rather suddenly began to lose flesh and strength, and this proceeded so rapidly, that in the course of two months he had the aspect of advanced phthisis. His appetite was unimpaired, and he daily rode on horseback. He had no cough, no expectoration, no hæmoptysis. His pulse was small, weak, rapid. He began to have chills and moderate night sweats. At this time he was placed under my care. *The whole chest* was duller than natural on percussion, and this dulness increased perceptibly till it was very manifest. The respiration, at first deficient, was dry and tubular throughout ; the voice bronchial. There was remarkable impairment of the *mobility* of the chest on both sides ; it appeared fixed down. *Dyspnœa* on the slightest exertion was his only distressing symptom. He faded away rapidly, and died, having *never expectorated anything whatever*. Towards the end he coughed very little, not sufficient to attract the notice of any one, nor to distress himself. I examined the body twenty hours after death. The entire extent of both lungs was solidified by a deposit of grey and yellow tubercle throughout their whole structure.

I need not dwell on this case further than to point your attention to this most terrible form of tuberculosis, which saps the foundation of organic life, and kills, as one may say, by an entire decomposition of the blood itself. He died, wasted to an extreme degree, without the pre-existence of a single drain on the system, for the sweats were very slight, and there had never existed expectoration or diarrhœa, and these, as we know, are the great causes of bodily waste in consumption.

Now let us examine, in contrast to this, the more ordinary form of tubercular deposit—the formation of a few scattered grey granules, principally in the apex of one lung. To the careful auscultator the signs reveal it; but I will not now dwell on this branch of the subject, as they are familiar to all of us, and to my mind so distinct as to leave but few improvements in our practice to be expected, or even desired. But what are the symptoms? Infinitely varied, presenting every degree of vital disturbance, from slight failure of strength to a hectic of great intensity. Is the amount of local disease the measure of the constitutional disorder? The answer to this is the best illustration of the proposition which I have endeavoured to keep before you to-day. With the same extent of local disorder we have the greatest inequality in the systemic derangement; in one person we shall have high pulse, evening flushes and chills, and the early morning sweating, combined with a rapid wasting; in another, the deposit causes so little irritation that he neglects all prudential precautions; nay, in the same individual we shall see successive deposits in the lung accompanied by the most different degrees of irritation in the system; or, *more curious still*, we shall have a violent constitutional disturbance which shall disappear while the lung affection *remains as before*, evidenced by all the known physical signs! As cases are the best means of impressing facts on the mind I shall briefly state one, which illustrates the invasion of tubercle, its common constitutional symptoms, and the persistence of the deposit in the lung without softening taking place, while the health has been restored.

J. K., aged twenty-seven, consulted me in 1846. He is a very well-built man; wide, deep chest; no predisposition to phthisis. Being fagged and out of spirits from pecuniary difficulties, he attributed a slight progressive loss of flesh to this cause. After violent exertion, he had a slight florid hæmoptysis, accompanied by pain of rather an acute character in the apex of the right lung. Febrile symptoms succeeded, and he rapidly lost flesh. He had night sweats to some extent, and a harrassing cough, with scanty expectoration. Under the use of counter irritation, a generous diet, horse exercise, and cod-liver oil, he slowly regained health. In 1848, two years later, he had again slight hæmoptysis, with a recurrence of the same symptoms, which again subsided. In 1855, seven years later, he was seen by me and examined with a view to effecting an insurance upon his life. *This was nine years from the first attack.* He was in excellent general health; no cough; no expectoration; had gained flesh (though never emaciated) within the last year. The chest movements were perfect; the percussion note was still dull under the right clavicle, where there was very deficient and rough inspiration, and marked vocal resonance. This life was declined by two of the first London insurance offices, the above history being attached to it. Up to this point we seemed to have but a trivial affection to deal with; but the last three months have altered this opinion. He has rapidly wasted; sweats at night; again coughs;

has frequent slight hæmoptysis; and has lost strength considerably. The only physical sign is, a fine moist crepitus over the spot where formerly some deposit in the lung was alone indicated.

I would here call your attention to the *progressive* character of the tubercular disease. There are *successive* attacks; it may be successive deposits, or more commonly a first deposit coincident with the softening and breaking up of one previously quiescent or latent. It would seem almost a result of accumulation of the material in the blood, which is determined to a deposit by some extraneous circumstances; but how clearly does this point to a systemic cause as the origin and root of the affection. No merely local irritation could evince such uniformity of progress. An inflamed lung is blocked up, and is resolved, or suppurates, or remains indurated. But no subsequent changes, no new or subordinate action, are superadded—no sequence of similar attacks occurs; while, on the other hand, the degenerated blood which has produced tubercle has a fresh source in the disordered system, and throws off again and again the ill-vitalised product of its waste material, to which the former deposits may themselves have contributed; and hence the downward progress of our cases and their enormous fatality. But correct the systemic disease; invigorate the ill-nourished tissues by a supply of good blood; let the nutrition of the body be improved by good diet, fresh air, healthful and cheerful occupations; improve the nervous and vital energies; and the local deposit formed at a time of exhaustion may remain quiescent for years.

I would here notice the occurrence of sweating in the first stage, before softening of the tubercular mass has begun. In noting a large number of cases at this hospital, I have remarked two periods at which this excessive action of the skin occurs. *One is very early in the course of the disease;* it may (as already stated) precede the physical signs, or it may take place when a deposit is already formed in the lung. The other is found as a concomitant of the softening process; and there is almost always a clear interval, it may be, of weeks or months between them. The first is not so manifestly preceded by chills or shivering as the last, which is more truly of the hectic character. The first is more controllable by remedies, such as zinc or gallic acid; it is also more common as a single paroxysm in the twenty-four hours, and is not double, like the later sweating. Does not this early sweating indicate rather an effort to rid the system of some noxious matter, than the termination of a mere febrile access? Is it vicarious with the impeded lung exhalation? In any case its amenability to remedies which act directly on the constituents of the blood, seems to argue a cause deeper seated than that relaxation of the tissues by which it has sometimes been sought to be explained.

I will only briefly notice the stage of softening, for it is the period of the disease when all the symptoms are worst, and when the local affection and the constitutional or blood disorder exasperate each other. The ill-organised and crude tubercle has taken its first step towards

decay, and involves the lung tissue in its destruction. The type of the fever is irritative ; the local affection produces the kind of hectic which attends all extensive suppurations in important parts, and rapid pulse, chills, sweating, and marasmus quickly exhaust the patient. I would here observe on the specific character of these symptoms of irritative fever, which they share in common with that produced by any suppuration in vital organs. Whence the remittent character of hectic? and what are its analogies? We may not be able to decide on its proximate causes, but its analogies class it with a disease of blood-poisoning induced by exposure to malaria. The differences would seem to consist in the shorter duration of the cold stage in phthisis, and the greater sweating in marsh fevers. You are probably aware that it has been asserted that the prevalence of malaria is antagonistic to phthisis, so that patients have even been sent to swampy districts to cure their consumption. I shall have occasion to notice this apparent antagonism between ague and tubercle, and will here only remark that during a residence of many years in the malarious plain of Rome, I never had occasion to see or hear of the occurrence of intermittent fever in persons already phthisical, (who constitute a large proportion of the English residents there,) while no year passed over without healthy persons suffering from malaria. The meaning which I desire to extract from the fact here is only an inference that both the diseases of phthisis and ague are caused by blood-poisons, (though of a different character,) and that this very antagonism, if it do exist, rather argues in favour of this view; for other analogies will readily be found in the action of different poisons on the blood in neutralizing each other, such as mercury and syphilis, sulphur and psora, arsenic and certain skin and malarious diseases.

We are bound, however, to keep well before us the fact that in this second stage of tubercle, where softening occurs with its concomitant hectic, we have no means of ascertaining the cause without having recourse to a careful physical examination. The same symptoms may arise from a diseased joint, or a chronic abscess, from a suppuration in the liver, or a pneumonic abscess in the lung, or from an empyema. It is therefore only by a careful correlative study of the previous history of the case, with its existing physical signs, that we can arrive at an accurate diagnosis.

The third stage of phthisis, or that in which the disease in the lung has produced destruction of the proper pulmonary tissue and resulting excavation, is very full of interest to us. The physical signs can alone declare its existence; for, as we have already seen, symptoms of every degree of severity, or death itself, may have occurred in either of the earlier stages. Excluding the cases of rapid consumption, we might say that the slow occurrence of excavation is evidence of a great curative effort made by the system to isolate the local disease, and throw off the tubercular matter. It is not necessary for us to assert that this is the only, or even the principal, stage in which a cure is effected, for

I have before shown certain reasons for believing that a deposit of tubercle in the first stage may be removed; but surely Laennec had a great pathological truth in view when he stated this to be the period and manner of a natural cure.

In symptoms this stage may resemble any of the former; it may rapidly terminate the case by extreme hectic and marasmus, or it may, after many attacks of irritative fever, leave the patient in tolerable health, and with but few of the marks of a fatal affection visible in his aspect, or sensibly diminishing his vital powers. Let us regard the two cases attentively.

In the rapid wasting, cachectic appearance, extreme vital exhaustion, and miserable end of the first class of patients, we see every evidence of a gradual and increasing blood contamination, poisoning life at its nutritive sources, and reducing vital powers till extreme exhaustion ends the scene. Death in these cases is not from dyspnœa or apnœa, for many patients live with a larger amount of lung disease than is often found in those who die. Here, again, the *extent* of the local affection is no measure of the urgency of the case. It is the degree and amount of blood contamination, and of the consequent exhaustion of the sources of nutrition, by which the scientific physician will guide his prognosis. If the original tubercular taint continues, the local disease furnishing, by means of the veins, a constantly fresh fountain of contamination to the blood, as indicated by successive deposits in the lung, the larynx, and the intestines, and seen in the enormous and increasing expectoration, the harassing cough, dysphagia and aphonia, and in the colliquative diarrhœa, we have no hope to offer. But if, on the other hand, the vital powers rally, and the local affection becomes circumscribed, we have an admirable picture of the effort which the system can make to struggle against a vital injury, and to throw off an irritative element from the blood.

I know of no pathological state more gratifying to study than some of these chronic cases of cavity in the lung, which some have unthinkingly called the opprobrium of our art. The physical conditions should be clearly borne in mind. We have a one-sided affection, circumscribed and well-marked in extent. On its margin there is no evidence of softening; no soft crepitation, nor evidence of more than a consolidation of the lung. Below the gurgling, or pectoriloquy, or cavernous blowing, we have clear and healthy respiration, and the opposite lung is unimpaired. We are all familiar with the appearances of these cases after death. There is a cavity of irregular shape, and generally lined with false membrane, which is continuous with the bronchial mucous structure. Within it, we may find those hardened bands which are either the remains of bronchial tubes or blood vessels obliterated. Carefully covering in this cavity there is an indurated wall of condensed pulmonary structure, which by a process analogous to inflammation has been thrown up as it were to prevent the extension of diseased action; while, covering the portion of lung so exca-

vated, and which is generally superficial and near the apex, there is formed a chronic thickening of the pleura, with dense adhesions, binding it firmly to the costal parietes, impeding their mobility and forming an admirable defence against injury from without. With such an isolation of local disease, we have all seen patients supporting life, and even entering into its most active labours for years, and though the ultimate contraction of such cavities and their obliteration be a rare occurrence, we know that it is a possibility, and we have reason to believe, a more frequent pathological event than has been hitherto credited.

It is important to notice here, that although a very great rally may be made by the system which has resisted an attack of tubercle ending in excavation, yet that there is a limit to the extent of recovery, so to speak. The patient never regains fully the flesh which has been lost; but although he may be able to follow the ordinary occupations of life, there are certain drawbacks to his convalescence, which may be stated to be, that neither in muscle nor in vital power is he ever equal to his former standard of health. This state will be better appreciated if we regard its probable cause. The lungs, as organs serving a vital purpose in the economy, may be presumed to be in volume and capacity exactly suited to the requirements of the healthy body—in other words, the oxydizing and exhalant functions are in proportion to the wants of the system. And so of their supply of blood; an exact proportion must be observed between the systemic and the pulmonary circulation, or the healthy par of the economy is overbalanced on one side or the other. Now, with diminished respiratory volume, there is necessitated a diminution of the daily waste of the carbon in the system, which otherwise could not be got rid of, but must be thrown on other organs in excess, or remain in the blood as a poison. And so of the water, which is ordinarily carried off in part by the pulmonary exhalation, though it finds outlets by the kidneys and skin. In all cases, however, of loss of respiratory surface there is wasting of the tissues, an obvious means of restoring the balance between the body and the decarbonizing organs, without which any approach to healthy action would be impossible. This wasting is also well seen in congestive bronchitis, the system being reduced to a balance with the lessened aërifying capacity of the lung, and till this balance is attained in acute cases the suffering is extreme. The advanced stages of phthisis well illustrate this point. Where the marasmus is extreme, the exceedingly small pulmonary surface which remains in action seems sufficient to supply the diminished wants of a wasted body, and the toleration of life with so exceedingly limited a respiratory action, and so little real distress in some cases, can only be explained in this manner.

The sweating of phthisis has surely a similar meaning. First, it acts in reducing muscular volume to the altered respiratory capacity; and, secondly, it is vicarious to some extent of the exhalant function

of the lung, with which local disease has interfered. The average difference of the vital capacity of lungs in health and in phthisis (all stages being taken together) was found to be 93 cubic inches, the healthy standard being 222 inches, and the phthisical 129. (Experiments on the Spirometer by Dr. Hutchinson at this hospital—total number of cases examined, 415.) This enormous disparity will serve to account for the necessary systemic disturbance from the lessened respiratory volume.

There are other cases which linger out with less vigour than these, but with great prolongation of life. I will briefly mention one which has been under my observation for sixteen years, and which has been examined and could be attested by many of the most eminent practical authorities in the profession.

A lady, now forty-eight years of age, without any inherited tendencies to phthisis, was, when eighteen, attacked with all the symptoms of consumption, having had frequent hæmoptysis, cough, purulent expectoration, and hectic. She exhibited the ordinary symptoms of chronic phthisis, with fluctuations in her state of health, till 1842, when I saw her, and had the advantage of Dr. Williams's opinion. He recognised a considerable excavation in the apex of the right lung, and signs of commencing softening in the left. I myself took charge of her, in 1842, for a journey to the south of France and Italy, but without any hopes of even prolongation of life, the wasting being progressive, and the hectic severe. In the spring of the following year, her health got rapidly worse, the marasmus reached the third stage, she was confined to a couch, expectorated profusely, and had excessive night-sweats. At this time, a cavity formed in the opposite lung. In this condition, worn out by fever, and with double and extensive excavations, which gave rise to an almost daily hæmoptysis, it is no wonder that several distinguished physicians prognosticated a speedy fatal result; yet she rallied, and after a residence of four years in Italy, she returned to England, and now resides in London in the winter. Her present state is this:—She has a daily copious expectoration, and frequent hæmoptysis. She is considerably emaciated, and has the aspect of chronic phthisis. On exertion, she has great dyspnœa, and going up stairs is very painful so her, yet she can walk more than a mile. Long journeys always agree well with her. She has frequent attacks of severe hectic and sweating, which is her principal distress. Her chest is very remarkable: anteriorly, it is flattened down under both clavicles, and immovable on respiration. Under each clavicle, there is an extensive cavity, with the ordinary signs. Posteriorly, and above, there are the signs of cavity, as in front: but lower down there is a remarkable provision for respiratory compensation most unusual in phthisis. The lower portion of the chest at the back is arched out, and barrel-shaped, as in emphysema; but it differs remarkably from emphysema in this, that the respiratory murmur is loud, and even puerile, proving that the air-cells, though enlarged, have retained

their elasticity; while the opposite condition prevails in emphysema. In fact, the respiratory space is at the base of the lungs, both apices being destroyed. In this lady, there exists that remarkable vital vigour, without which such an amount of local disease could not have been tolerated; and she combines with considerable mental powers and sanguine temperament the uncommon addition of a mind free from that concentration on the variations in her health which so exasperates chronic affections. Her digestion is good, and there is no reason to suspect tubercular deposit in any other organ than the lungs.

With this case, I would draw my observations to a close for to-day; but before concluding, I desire to impress on you the object of my thus recalling your attention to facts in the history of phthisis which you will all consider old. It is, that we may together stand aside, in these days of hypercritical chest diagnosis, and regard an old picture in a new light, renewing our acquaintance with its familiar features, in order to correct, by a general view, the aspect which it may have assumed when studied too much in detail; it is, that we may not fall into the error of endeavouring to appreciate the form, the limits, and the import of a grave affection by a single sense only, but rather with every inlet to knowledge wide open for the reception of truth; and that so, if we cannot answer the sphynx question which is daily devouring our population, we may at least place ourselves in that philosophic attitude which, by adopting general and enlarged notions of disease, prepares the way for scientific advances, if it does not itself lead to important discoveries.

As regards climate, we are aware that no known region of the earth free from phthisis. It is found in our West Indian islands in its most acute and rapid form; it is found in Sweden and Norway about in the same proportion; in the Anglo-Saxon countries it prevails in somewhat of the following order as regards intensity, measured by its fatality: Scotland, England, United States, and Ireland. It is very fatal in Australia. It is rapid in all its stages along the southern swamps of the Mississippi. It is prevalent in our Canadian colonies with their sharp winters and pure air. In Italy, the country to which we are in the habit of exporting our patients, it is a disease of universal prevalence and of great intensity, as I have myself witnessed; it is often "galloping consumption," and looked on by the Italians as a contagious disease of great malignity. The figures quoted by Louis from the English army statistics well illustrate the universal prevalence of the disease in all climates, and allowing for the uncertainty of all statistical returns, they may be accepted as very fair evidence of its relative fatality.

In Canada, the mortality from phthisis was 6 per 1000 annually.

„ Bermudas	„	„	„	8	„	„
„ Malta	„	„	„	6	„	„
„ England	„	„	„	6·4	„	„

The difference to be noted here is very slight, while the range of temperature and the variety of climate is extreme, the prevailing atmospheric influences of the most opposite character, and the range of latitude very great. If we are to seek, then, in *climate* for an exciting cause of phthisis, we shall be at fault. The remedial effect of climate is another question, which I shall afterwards notice. Now, what effect has *season of the year* on the commencement of phthisis? We reside in a very fluctuating climate, where the ranges of temperature are very great and the changes sudden, and, above all, where moisture to a high degree is found in the atmosphere; and were consumption a disease of inflammatory origin, such as bronchitis, we should expect to find that it commenced at those periods of the year when the air is most cold and moist, and all the atmospheric influences most predisposing to irritation of the pulmonary organs. With a view to elucidating the effects of season of the year in inducing phthisis, I examined carefully into the history of 487 cases of well-marked tubercle, which were under my own care in this hospital, and in which I could get reliable information, and I found the following results:—

In the spring quarter,— March, April, May ...	there were	154	cases,	commenced
In the summer quarter,— June, July, August ...	"	75	"	"
In the autumn quarter,— Sept., Oct., Nov.	"	141	"	"
In the the winter quarter,— Dec., Jan., Feb.	"	117	"	"

We thus see that the spring and autumn originated by far the largest number of cases, then the winter quarter, and finally the summer. Now, the winter quarter, which ranks *third* in the list, is the period of the year at which most cases of bronchitis commence; when, in fact, the influences of weather and its changes have most effect. The spring and autumn, however, seem to hold the pre-eminence, and the summer stands at the bottom of the list. As these figures have been prepared impartially and with care, I think them worth presenting to you; but allowing even for the deduction that the same season which produces the highest degree of irritation in the bronchial membrane only ranks *third* in the production of phthisis, we may perhaps say that they rather illustrate my general proposition, that *season of the year*, as an originating agent, has much to do with the essential cause which gives birth to consumption. As regards the season of greatest mortality in phthisis, it has no relation to our subject, and so manifestly bears on other questions, such as the complications of the disease, and the vital resistance made by different individuals, that it has no place in this argument, nor would it be found in any degree to illustrate this discussion.

Next, what has *sex* to do with the production of phthisis? A very

good answer to this question is to be found in the fact that Louis states that "it seems difficult to question the fact, that, in France, at least, and more particularly in Paris, phthisis is considerably more frequent in females than in males." Dr. Borne, in his Report of the Royal Infirmary of Edinburgh for three years (1834—36), states that, out of 297 cases, 185 were males, and only 112 females; while the first medical report from this hospital, in 1849, gives 61 per cent. males and 32 per cent. females. Again, for the provinces, the Registrar-General's report is 28 per cent. females, and 24 per cent. males. Thus we have a greater number of *females* affected in Paris and the country towns of England, and a much larger proportion of *males* in London and Edinburgh. From these numbers, then, there is nothing to be gained with reference to the question of sex, if it be not that other social causes, dependent on the aggregation of large numbers of persons together in great cities, slightly turn the balance against the male sex, and that slight preponderance is, probably, in the proportion of the population of Paris to that of London.

And what shall we say of constitution—of the weak and the strong habit of body—as predisposing or remote causes of phthisis? If we refer to authorities, we are met by a mass of conflicting evidence. Louis says, "that an analysis of his cases showed that phthisis passed through its stages as rapidly in strong as in weak individuals—nay, even more quickly in the former than in the latter;" and further adds, "that he feels it to be his bounden duty to express his doubt as to whether the popular doctrine, that the weak constitution predisposes to tubercle, be true." In this hospital, the daily practice affords grounds for the same doubt. Did opportunity permit, I could present to you individuals of the most robust build, with large and deep chests, and great muscular development, who have tubercular cavities in the lung. Their physical condition attaches them to the class which I have designated as "tolerated cavities." They are, naturally enough, amongst the out-patients, having no reason to come and reside in a hospital, and they follow their usual occupations with somewhat less of vigour than they would have done before the tubercular attack. I may remark here that many such cases present themselves but once or twice in the out-patients' department, some coming long distances from the country to have an opinion, after which we lose sight of them. They are, however, registered, and carefully noted; and I could, perhaps, produce a history, written on the spot, of twenty or thirty such cases, from my books.

My colleague, Dr. Cotton, has observed, "I have seen many cases of phthisis overlooked, in consequence of a well-formed and, to all appearance, healthy chest, having been deemed incompatible, not only with the existence of pulmonary tubercles, but even with the tuberculous diathesis. The life-guardsman, the pugilist, the blacksmith, &c., notwithstanding the fully-developed chests which their several occupations induce, are, *cæteris paribus*, quite as liable to the inroads

of phthisis as the mechanic or artizan whose daily task leads to the opposite result."

Now, such is our experience here; and it is at least negative as far as regards the influence of the weak habit of body.

Occupation next stands on our list. Now this is a very important subject, and I confess that it needs more investigation. I have tabulated the results of an examination into this subject, made by myself from my own cases at this hospital, and as it has been done with care, I offer it as a contribution to the large and daily increasing mass of statistics which we are collecting.

Occupation in 652 *Cases of Phthisis:—*

	Cases.		Cases.
Domestic	145	Printers	13
Servants	95	Tailors	12
Open-air pursuits—Gardeners, Cabmen, Grooms, &c....	62	Policemen	8
		Millers and dusty occupations... ...	7
Needle-workers	52	Beershop-keepers ...	7
Labourers	45	Bakers	6
Carpenters	43	Sailors	6
Shopkeepers	44	Hairdressers	4
Shoemakers	27	Soldiers	2
House-painters	20	Glassblowers	2
Clerks	20	Butchers	1
Teachers	16		

You will observe, from the table, that I have noted 652 cases of phthisis. They were all well marked, and I have excluded from the list those on which there was any doubt as to the nature of the affection. It is remarkable, from this, that the domestic, homely, and sedentary occupations vastly outnumber all the rest; for if we throw together the *domestic cases* (or those who are attending to household concerns, and who are generally females in a class of life which demands that their time shall be spent with their families indoors) and the servants, needle-workers, those occupied in shops, tailors, shoemakers, and clerks, we shall find that they amount to 393 out of 652, or more than one-half the entire number—seven occupations furnishing this result, out of a total of 22.. I shall have occasion to notice again how this fact helps us towards a solution of our question of the nature of phthisis, and will only stop here to remark that sedentary pursuits *imply two things pre-eminently—want of fresh air, and a minimum of muscular waste and renewal.* It is also important to observe, what has often been remarked here, that *butchers* are singularly exempt from phthisis. In my table only one appears, and when we consider that this class is remarkably supplied with abundance of animal food, which they generally consume twice or thrice a day, that their shops are open to the air, and that their business necessarily requires much exercise and driving about, we may

gather how important an influence a highly stimulated nutrition, and these conjoint conditions, exert in opposition to any chronic disease. Dr. Copeland says that he would advise any one threatened with phthisis to become a butcher; nor can we wonder at this when we remember the well-fed specimens which may be seen in this metropolis in their shops. It is fair to state that this opinion is opposed by Louis, who says, "that out of thirty phthisical cases, only twelve had been badly nourished, and eighteen had been well-fed; yet the disease occurred at almost identically the same period in both—a result which (he says) afforded me no small surprise." In reply to this we may observe, how limited was this experience as compared with that which we can offer here!

The influence of anxiety, the depressing passions, of social misery, of a life of seclusion from the healthy stimulus of society, of habitual intoxication, of chronic indigestion, and of a number of other causes allied to these, is recognisable in many of our cases, and will ever form a subject of deep study to the scientific physician in his investigations into the origin and indicated treatment of every individual case; but until we can ascertain that these causes tend to produce phthisis *more* than other chronic disease, we are much in the dark respecting their influence and their import in connection with consumption. But it may be remarked, that they are causes which, as a class, affect the *vitality* of man, the nervous controlling power which presides over organic life, and that they are ultimately connected with the last changes which elevate aliment into tissue, and with the functions of secondary assimilation which lie at the root of organization. They are of deep importance, and are receiving daily more attention; and in this hospital we are, I trust, accumulating materials for their elucidation; but their consideration is outside our present object, and the limits of a lecture would but feebly outline the truths of which we are in possession regarding them. So far we may state, that our present knowledge is insufficient to class them as originating causes of tubercle; that the same conditions will produce other widely different affections; and that while this is the case, it would be incorrect to attribute much value to them as causative agents. Phthisis may be found, and is found, in the well-ventilated, well-warmed, and luxurious dwellings of the rich, where food of the best kind is unlimited, and where hygienic measures are the rule of daily life. It is a mistake to suppose that over-luxury involves, now-a-days, so many breaches of sanitary laws as it formerly did. The truth is, that our middle classes are in the most favourable condition for health, and extreme cleanliness, good food, regular exercise and sleep, and yearly changes of air, are the habits of thousands in this metropolis. Are they exempt from phthisis? Or can we select the numerous cases which occur in this class and assign to them their predisposing cause in the breach of any hygienic law? If we know anything which wealth can buy it is this—the timely and prudential require-

ments which, in the form of wholesome food, fresh air, and frequent changes, may assist the vital energies of the delicate and scrofulous child; but with every resource which money can command, can we always, or even often, succeed in our object?

To select from our professions those which seem most prejudicial to health is indeed not difficult, but we want here the large statistical numbers which such institutions as this supply. Yet, perhaps, if we said that the clergy and our own profession hold the first places in the fatal list, we should not be far wrong. And if we argued from this, that those who are hardest worked in the great struggle of life, and whose energies and feelings make daily demands on the *vital power* of which I have spoken—while their bodily exertions are often pushed to fatigue—are undergoing the conditions most favourable to the production of tubercle, we should not greatly err. It has been remarked on this subject, that the main element of success in professional life in London is health for the first fifteen years. These are the fatal years—the fatal period of life as regards phthisis, when the inherited taint, or the disordered blood, leaves the system unequal to the requirements of hard work of body and mind. Why are they the fatal years? They are the period at which the waste and repair of the tissues is most active; when growth has ceased, but nutrition should be in the greatest vigour as a *sustaining* agent of the animal system. They stand intermediate between the mere perfecting of the vital machine and the time when organs which have been fully worked repose, as it were, and permit of an accumulation of the material of the fabric. The deposit of fat which takes place in most men after forty years of age marks this transition. The stage of growth is eminently fatal in the phthisical habit; the nutritive period second in danger; and middle life to age constitutes the third, and least dangerous. All statistics, in every climate and under every physical and social condition, tell this story; and we learn many deep truths from a study of these successive periods and this sequence of processes in the animal history.

Now this cursory view of the influence of predisposing causes, however it may fail to account for the tubercular crasis, has an important bearing on our proposition, that phthisis is essentially *a systemic disease*—that its origin is not local, but connected with the most deeply-seated vital processes. Let us look next at the evidence relative to its origin from local inflammatory causes. There is no reason to believe that a simple catarrh leads to phthisis. Its commencement, at the season of the year when bronchitis is most commonly at its minimum, as shown by the tables before referred to, is opposed to this view. Besides, the cough is not the earliest symptom, and there may be a consumption without any cough.

[We must now consider the affections which are rarely allied with phthisis, and which are supposed to be antagonistic to it. We are at once struck by the remarkable immunity of the phthisical to other

diseases, exhibiting almost a pre-occupation of the system, to the exclusion of other poisons.]

Skin diseases of every class are extremely rare in phthisis; if there be an exception, it is *herpes*, and that is not often seen. The excessive action of the skin, as shown, not only in the hectic access, but in the relaxed and flabby condition which obtains in chronic phthisis, may partly account for this exemption; but a deeper cause is no doubt to be found in the state of the blood.

Rheumatism is also very rare, and Rokitansky considers it antagonistic, as absolving the fibrin of the blood in its action on the fibrous tissues, where plastic deposits so commonly result. The same of gout; it is rarely combined with phthisis, and for reasons connected with the systemic disorder which time does not permit of our examining.

Hypertrophy of the heart, or hypernutrition of any organ, is not often found combined with tubercle. Cancer may co-exist with it, but their coincidence is not common. I have myself recorded ('Pathological Transactions,' vol. iii.) a case of the kind, seen and diagnosed during life, and verified by the post-mortem appearances; and others may be found in medical works.

External strumous enlargements of the glands proceeding to suppuration are certainly not a common complication of tubercle in the lung. It is rare to meet with the scars of scrofula in the glands of the neck in the cases presenting themselves here. This is a practical observation which I believe the experience of my colleagues will corroborate; and it is a curious fact,—for we are accustomed to class tubercle with scrofula, and to attribute its external manifestation to the same cause which induces phthisis. Whether it be that the glandular swellings act in diverting the morbid action from the internal organs, or whether the two affections are not due to the same constitutional cause, is a very deep problem, and one very suggestive of theories which, in the present state of our knowledge, would be premature. Suggestive facts are of all the most valuable, if we guard ourselves from too hasty a generalization, so often leading to a defence of deductions which may have been too lightly assumed.

Rickets in the developed subject, where growth has ceased, are certainly but seldom combined with tubercle in the lung. *Deformed chests* are generally healthy, or emphysema and cardiac disease from congenital defect or malformation are the affections met with; but *not phthisis*. Is it that the ricketty child is invariably carried off before the age at which consumption assumes its greatest intensity and its largest rate of mortality? The immunity of such subjects is certainly a remarkable fact.

Of *lung* diseases, emphysema is the one which seems almost antagonistic to phthisis; nor is this to be wondered at when we reflect on the atrophy of the pulmonary tissue and resulting diminution of respiratory volume which are the leading characters of the latter, constituting physical conditions which are the reverse of the distended cells of emphysema.

Anæmia, even in its extreme or chlorotic stage, is not commonly allied to tubercle in the lung; and as the popular idea is counter to this, I would make a few observations on their differences. The symptoms of anæmia are extreme pallor of the skin, the tongue, the mucous surfaces, and the palpebral conjunctivæ. The veins are small and purplish; the pulse is weak, compressible, rapid and thready. There is dyspnœa on exertion, and palpitation, and generally a short, dry cough. Faintness and occasional syncope indicate the imperfect supply of blood to the nervous system, and œdema of the extremities points to enfeebled capillary circulation. The physical signs are—that the percussion note is uniform and good, and the respiratory murmur low. Over the aortic valves there is often a soft murmur synchronous with the first sound, and a venous murmur, or whizzing, is heard in the neck. Such patients often come to us as consumptive, but a differential diagnosis is by no means difficult. First, there is the *absence of rapid wasting;* there is no hectic; and the symptoms of weakness are distinctly referable to the impairment of *nervous* power rather than to muscular debility. The absence of the physical signs of phthisis is of course diagnostic; but it is still further remarkable that the soft murmur of anæmia in the aorta, and the whizzing in the veins, are rarely found in tubercle of the lung. For this observation, which my own experience confirms, I am indebted to my colleague, Dr. Thompson. The stage of phthisis which is accompanied by symptoms of impoverishment of the blood, and which is certainly a true anæmia, in so far as it manifests and actually consists in a deficiency of the coloured corpuscles of the blood, is not to be confounded with pure and (so to speak) idiopathic anæmia. The phthisical condition referred to is more properly a *cacoœmia*, and takes place when the blood contamination has reached a stage which is only coincident with an advanced period of the tubercular affection. The comparison I have instituted has reference to the doubtful symptoms of the *early stage* of phthisis.

The influence of *pregnancy* in retarding consumption has been observed on and deserves our consideration. That it *has* such influence is, I believe, true, and the conservative protection of life for an important physiological purpose is very manifest in this provision. The advanced case of consumption will outlive parturition, to become rapidly accelerated when this important function is completed. Whence is this? Are we to attribute it to the exhaustion consequent on labour and the sanguineous loss? or to systemic causes of a deeper seat? That Nature preserves a life for an important purpose is only a statement of the fact in other words; we want to know *the means* by which this retardation of the tubercular stages is effected. In the absence of absolute knowledge, and straying from our inductive argument so far as to theorise and then apply the facts, (a method by no means free from the danger of serious errors creeping in,) we might suppose that the hyperfibrinated blood, having another use in fœtal

growth and nutrition, ceases to deposit itself as tubercle, but that, this cause once removed, the fibrin expends itself once more on the morbid material in the lung.

The rapid reduction of the uterus itself after parturition must throw an excess of fibrinous waste into the blood, and hence the frequent origin of phthisis after labour, or the more frequent impulse which already existing disease so commonly receives.

Conditions rarely combined with Phthisis.

Skin Diseases.
Hypernutrition of organs.
New growths.
External suppurating struma.
Rachitis.
Intermittent fever.
Cancer.
Emphysema.
Pregnancy (retarding the progress of tubercle).
Anæmia (with the first stage).

These remarks naturally lead us to consider the various theories which have been proposed to account for tubercle formation, and we must feel, that to stop short without one glance at the deeper questions which arise out of these facts would be to sever a chain of inductive reasoning, before we have reached the limits which, even as practical men, we must desire to attain. On these limits truth and error reside, and speculation, impossible to check, begins. No man can reason up through a series of varied phenomena, possessing many common characters, without endeavouring to reconcile their points of resemblance, by referring them to a common cause, which, if proved, shall ever after assume the significance of a natural law, But these so-called laws, arising out of accumulated evidence, are rarely attained in vital science, and we must study, as feelers in the dark, with diffidence but not without hope.

Let us then, without advocating any theory, examine the knowledge which we have, from practice, with relation to the pathological problems which are daily offered to us regarding tubercle. Let us see if the facts which we have accumulated can be classified and referred to any common law of action. Now this will be best done by comparing announced theories with known observations, and in doing so we are secure from error so long as we take nothing for granted.

Undoubtedly the most prevalent idea of the day with regard to the nature of tubercle, is that put forward by Rokitansky, who says that "the tubercle crasis is without doubt a fibrin crasis—*fibrinosis*. It is not this in respect to quantity alone (hyperinosis), but also (and this is the more important side of the anomaly) in respect to *quality*." (Rokitansky, vol. i., p. 311.) Now we have not here to deal with the arguments in favour of this view, which are derived from chemical and microscopical sources, but propose only to consider how far the excess

of fibrin in the blood and its altered quality appear to coincide with, or account for, the phenomena of phthisis *as we see it*.

A simple excess of fibrin in the blood is common to several diseases, and to one period of pregnancy. Taking its standard proportion in health to be from 2 to 3 in 1000 parts, it is increased by local acute inflammations to 7 and even to 13, and in phthisis to 10. M. Andral, from whose observations I have borrowed the figures, states that it is increased in pregnancy after the seventh month, but diminished in the early stages.

FIBRIN.

In healthy blood, 2—3 in 1000 parts.

Increased in	*Diminished in*
Local inflammation.	Fever, simple.
Phthisis.	Typhus.
Later months of pregnancy.	Apoplexy.
Rheumatism.	Early months of pregnancy.

Its diminution below the healthy standard is noted in simple continued fevers, in typhus, and in apoplexy.

The leading point to remark here is, that tuberculosis notably increases the proportion of fibrin; and that in the history of phthisis in pregnancy we recognise a subsidence of the consumptive symptoms coinciding with the period of the *minimum* quantity of fibrin in the blood, and an increase of the phthisical disease immediately after delivery, when the hyperfibrination of the blood is at its maximum. So far this theory and the progress of the disease coincide.

Again, the proportion of fibrin in the blood is not lessened by bloodletting and anæmia, but perhaps relatively increased, an exhausted state of the system in these conditions resulting rather from a diminution of the red corpuscles than from a change in the fibrinous element. We thus seem to learn that many diseases of exhaustion do not lessen the solids of the blood, but render it more watery, and diminish the red particles. This altered condition may manifestly lead to certain changes in the capillary circulation by which the excess of fibrinous material shall be separated and deposited as extraneous matter. A highly-vitalising system might organise or remove it by excretion; an exhausted vitality may find it too much for assimilation, secretion, or organization, and hence it remains as an excessive product. But Rokitansky's theory expresses more than this; he speaks not alone of the *quantity*, but of the *quality* of the fibrin. On this point we might easily be led away into theories for which this is not the field of discussion. It is sufficient for our purpose here to remark, that, in its history, phthisis appears to furnish evidence that an increase of fibrin in the blood is one probable cause of the disease, and this corroboration of an experimental observation, is found in the following occurrences.

Its early symptom and well-sustained feature throughout its whole course is *wasting*. To this purely muscular waste is to be added the

destructive waste from deficiency of the ultimate processes by which blood is converted into tissue, and that of *secondary assimilation*. A malnutrition, in its highest sense, will leave the blood overladen with depraved material. It is also to be remembered that the lymphatic system is a feeder of the blood, and that the depurative organs may not be able to counteract, by secretion or oxydation, the perpetually recurring influx of altered constituents which a disease like tubercle, when once established, will, in its natural destruction and decay, present, through the lymphatics, to the circulation. All these are sources of contamination. Now, this waste of tissues will either hyperfibrinate the blood, or it will find an exit in the secretions, or it will be oxydized in the lungs. The solid constituents of the secretions are not perceptibly increased in consumption, and the respiratory space for decarbonization is greatly diminished by the tubercular deposit. Hence a recurring and daily increasing source of fibrinous superfluous material. The phenomena of phthisis in pregnancy favour this supposition, as already noticed.

I should be far from offering this explanation of varied phenomena as one sufficiently proved to take its place amongst our physiological facts, but the bearings of this theory on our practice should not be lost sight of, as it leads us to class tuberculosis with disorders of the blood constituents which lower the vital tone of the system. It is true that local acute inflammations increase the fibrin of the blood, but it is to be remembered that they do not alter its *quality*, for on this alteration depends the pathological import of phthisis. An inflammation terminates in a plastic deposit of fibrinous material, which becomes organized and nourished; while tubercle, in its lowered vitality, has acquired only a tendency to decay, which is inherent in its nature. The proofs which German pathologists seek to bring to bear on this theory, and which are derived from the fact, that diseases which appropriate fibrin in their growth are antagonistic to tubercle, have been before noticed; and it is remarkable that tumours and the hypernutrition of organs are very rarely coincident with phthisis.

With these remarks, which will be suggestive of varied questions to many minds, I leave this theoretical portion of our subject, but not without bespeaking for it your future study.

A lecture from this place would be incomplete without some reference to treatment; and as the argument on which we have proceeded —that phthisis is a systemic disease—receives remarkable confirmation from the results of practice, I would devote the few minutes which remain to us to a consideration of the remedies which, in this great hospital and elsewhere, have been seen to exercise the greatest influence in checking and arresting tuberculosis. You need not be told that I refer especially to those which, by increasing the nutrition of the body, and elevating the vitality, or altering (it may be) the chemical qualities of tubercle, exert so remarkable a power in retarding the advances of phthisis. Our experience of oils is a forcible corroboration

of the truth, that the disease of consumption is not merely a local affection, but a disorder of processes deeply seated in the system. Their operation has been so recently dwelt on from this place by one of my colleagues, that I need not dilate on their importance in the treatment of phthisis. It is now well known to the profession that an increase of weight is a very constant sign of improvement in our cases treated with cod-oil. It occurred in 70 per cent. of the cases here, while in 21 per cent. there was loss of weight, and 9 remained stationary out of the 100.

Dr. Prout remarks, that "the vital energies of animals, as exerted during secondary assimilation, can apparently change oleaginous matters into all the principles necessary to maintain animal existence."

Here, then, we have facts proving the use of oils as nutritives; but do they exert any further influence on the blood? There can be little doubt that they do so, and it is probable that by adding an oily ingredient to the low organization of tubercle the vitality of the latter is increased. Without any theory the practical fact remains to us as a great improvement in medicine. I may remark that I have myself caused experiments to be made on healthy animals, to the amount of some hundreds, which proved the fattening powers of cod-liver oil. These experiments are recorded in 'The Lancet.' But a still more important effect of oils on the blood has been observed; for under their use the fibrin diminishes, and the red corpuscles increase, as you will see by the following table, and that an improvement in health should coincide with such changes in the blood is not remarkable, if we bear in mind the probable pathology of the tubercular habit:—

RED CORPUSCLES IN THE BLOOD.

Increased by	*Diminished by*	
Plethora.	Anæmia.	Diabetes.
Iron.	Bloodletting.	Cachexi
Cod-liver oil.	Struma.	Abstinence.
	Phthisis.	

Among other remedies, iron exerts a very powerful influence on the blood, increasing the number of red globules often from forty to ninety, as in Andral's experiments. But it exerts no apparent influence on the fibrin, and is therefore, and for other reasons, less valuable than cod-liver oil. It is inapplicable where there is rapid pulse and fever; but very useful in certain cases of a chronic character, where the patient is blanched and anæmia prevails. In the earlier stages it is no doubt often injurious, and may even precipitate the disease if given while febrile symptoms exist in subjects of the sanguineous temperament. Other medicines of constitutional action find their place in the variety of cases which we are called on to treat, and amongst these may be mentioned alkalies. Opium and other sedatives have also a systemic action, long recognised in the treatment of phthisis, and it is important to remember that in allaying cough its *modus operandi* is double, mainly exerting an influence on the nervous

irritability of the bronchial membrane, and secondarily diminishing the requirements of the blood for respiration. It may fairly be questioned also whether gallic acid and oxide of zinc, which rapidly diminish sweating, do not act rather through the blood and nervous system than simply as pure astringents on the contractile tissues of the vessels of the skin.

Let us now glance at the remedies which act locally, such as inhalations of various character, sedative or stimulant, and local depletion and counter-irritation. By the former we may, it is true, allay irritability of the bronchial membrane; and when this exists, their use is undoubted and important: or, a local congestion may be much mitigated by topical applications to the chest; but here is their limit, and beyond this all experience shows that they can do nothing towards altering the blood condition which has produced and maintains the tubercular disease of the lung. The day has gone by for a belief in the curative powers of such means; but as the error is still in the vulgar mind, it is our duty, by taking a bold stand on our knowledge, to dispel such illusions as that an ulcer (as it is called) in the lung can be dried up by local stimulation, like an indolent wound on the leg. We can accept these means as adjuvants in our treatment, but we cannot permit them to be esteemed as remedies which counteract the tubercular habit. And so of climate—that much-disputed question, and long-overrated agent in the relief of consumption. An experience of some years in Italy, and a residence in many of the principal southern places of resort for invalids, enables me to speak with some confidence on this subject. What do we propose by removing a patient with tubercle in the lung to a foreign country? We select a sedative air, such as Rome or Pisa; and some have believed that the deposit in the lung was to be removed, and the open cavity or softening tubercle healed up, by the effects of a mild atmosphere! If the disease we have to treat were an irritation of the bronchial membrane, or a local inflammation become chronic, we might expect some relief from such means; and in pure bronchitis, or where cough is a *complication* of phthisis, we do indeed meet with remarkable results from change of air. But what of the cases of rapid tubercle, quickly developed, progressively sinking, with hectic and wasting of the tissues? The climate we have selected as remedial, itself produces these as from a hotbed; and it were far better to let Englishmen die in English land, than cruelly to separate them from home and friends, that they may perish miserably as exiles, with long-defeated hopes, and a final awakening to the unreasonableness of our ignorant mistake.

But some will say that the chronic cases, with slight fever and but slow wasting, and moderate pulse, do well; and I willingly bear testimony to this, for I have seen many such rally in health when in Italy, and return home with impunity. But let us examine why it is that they improve. And here, to such an audience, it is needless to dwell on the fact that change of air, of scene, and of diet, and complete alter-

ation in habits, have a remarkable effect in strengthening the vital powers and in improving the nutrition. Therefore, let us still export such cases, but not with a view to curing a local disease by the local application of a sedative air, for with a wrong theory at bottom we are sure to be disappointed in practice. With other views than these, we can select, as the most proper for each individual case, the kind of climate best suited to the requirements of his system; and here the higher skill of the physician is indeed manifest. To some the bracing air of the mountain,—of Alps or Pyrenees,—or even the icy climate of Sweden or Norway will be the best remedy for a lowered vitality; to others the calm skies and clear, sedative air of Rome will give greater vigour. With enlarged views of the disease we have to treat, a wider range of remedies comes at our disposal, and the deeper our knowledge of men and of nature, the more precise and satisfactory will be our practice and its results.

I am here obliged to pause in this rapid and imperfect sketch of a disease which, in its multiform relations, in its deeply-seated causes, and in its enormous fatality, has opened such a large page of pathology, that in considering only a part of its topics of interest, we enter on fields of research in which the most ardent student will find a study for years.

Before concluding, I would again recall to you the portion of this great subject to which I have directed your attention in these lectures. I have sought by a chain of inductive arguments to prove that phthisis is a constitutional affection with local developments, rather than a local disease with sympathetic disorder of the system. We have, as I believe, traced this fact, in its early symptoms, its progressive character, its successive attacks, and its various terminations. We have sought to find this general character in the *systemic* meaning of its symptoms, in its analogies, and by comparison of its features with those of other blood disorders. In the *non-allied affectious*, so rarely seen combined with it, we have found a support to the same view, and we have compared our facts, and only our observed facts, with the theories of the day. In the *negative* influence of seasons of the year, of occupations, and social causes; in the absence of proof that depressing agents lead distinctly to this rather than to other chronic diseases, we have perceived a necessity to look deeper for its originating causes. We have further observed, in the action of the best accredited remedies, such decided evidence of their improving powers coming through a general, rather than a local influence, that our argument has been in no slight degree strengthened by these researches into treatment.

In the effects of climate, its disappointing results in some cases, and its mode of improving vital actions in others, we recognise a similar agent to those medicines which exalt the animal nutrition. Finally, the theory most akin to modern pathological truths has been stated, but not insisted on, for undue or untimely conclusions on such ques-

tions, are the readiest means of shutting the door to further knowledge, and are apt to beget in us the indolent confidence inspired by an accomplished task.—*Lancet, August* 9, 16, 23, *and* 30, 1856, *pp.* 154, 186, 213, 244.

18.—EXPERIMENTAL NOTES ON GLYCERINE.

By Dr. W. Lauder Lindsay, Perth.

[In order to test the nutrient properties of glycerine, Dr. Lindsay tried its effects upon himself, by taking two or three teaspoonfuls daily for several weeks. He says:]

For the space of a month I took two teaspoonfuls every morning in coffee, which I found to be the most palatable mode of using it. My diet and daily occupations were the same as before I began to take it; my exercise, in consequence of protracted bad weather, rather less than usual. The result was a gain of weight to the extent of 1½ lbs. at the end of the first fortnight, and of an additional ½ lb. at the termination of the second—in all, an increase in weight of 2 lbs. On discontinuing the glycerine, my weight gradually fell: and after an interval of six weeks, during which I have not used it, I find myself 1 lb. lighter than before I began to take it daily. It produced no other appreciable effect. I have tried it as a dietetic remedy along with various articles of food, and in divers combinations. It is so readily miscible with fluids of all kinds, that there can be no difficulty in its administration. The pure concentrated glycerine of Price's Company is too pungently sweet to be used alone or undiluted; and I may here remark that, as a general rule, whether for internal administration, or for external application, it ought to be diluted, the degree of dilution being regulated by the practitioner, according to the purpose for which he prescribes it. I have sometimes sweetened coffee with it instead of sugar. Coffee, so made, however, has a somewhat peculiar taste, which might prove objectionable to some fastidious stomachs; but when it is sweetened only partially by glycerine, or when glycerine is superadded to ordinary sugar, the beverage is exceedingly pleasant, and quite free from any peculiar flavour or taste. It might be used daily to a considerable extent, when thus mixed with coffee, or chocolate; it is perfectly miscible, and does not betray its presence by floating oil globules or otherwise. In such circumstances, it behaves precisely like a syrup. Tea, to which glycerine has been added in a similar way, is much more apt to be flavoured by it, but the taste is not likely to be regarded generally unpleasant, unless it is added to the extent of two or three teaspoonfuls per cup. It also sweetens milk or cream very pleasantly. A mixture with water is very palatable, and is, undoubtedly, its most ready and cheap mode of administration.

I carefully observed its effects, as a nutrient and alterative, in eight patients—four males and four females—to whom it was given in doses of two or three tea or table-spoonfuls daily, for the space of a month.

They were weighed, at intervals, to ascertain their gain or loss of flesh; for I found that apparent physical improvement was not a reliable criterion of real physical growth—that a most marked amelioration in the general health did not always coincide with increased weight of body. All the patients, before taking it, were more or less anæmic, emaciated, and feeble; in all the diet, exercise, and occupations, were otherwise the same. At the end of the month, all of them *appeared* greatly improved in their general condition; they seemed plumper, and stronger, and the countenance, in some, was even ruddy.

The great advantages of glycerine over cod-liver oil, consist in its pleasant sweetness and its freedom from all disagreeable odour; in its ready solubility in, or miscibility with, ordinary fluids; in the absence of the principles, which in animal and vegetable oils, so frequently nauseate and purge; and in its solvent and other properties, which render it so useful as a vehicle or basis for pharmaceutical preparations. Its great disadvantage, on the other hand, as contrasted with cod-liver oil, we shall immediately see, is its present comparatively high price. Cod-liver oil frequently produces an acrid burning sensation in the throat; it is extremely difficult of digestion by many stomachs; by others, it cannot be borne at all, without generating disagreeable and even serious gastric symptoms; and, in general, nausea and purging are very frequent results of its use. These effects would appear more liable to be produced by the dark-brown, than by the pale or colourless, cod-liver oils. Many of the vegetable oils have a similar tendency to nauseate or purge, such as linseed, olive, and almond oils. None of these disagreeable symptoms are likely to be produced by the use of glycerine, and have not been produced in any cases which have come under my own observation. Hence it is reasonable to anticipate, that glycerine ought to become a valuable substitute for the ordinary animal or vegetable oils used in medicine as nutrients and alteratives, in the numerous cases in which they are contra-indicated—always, of course, granting or assuming what has yet, however, to be fully proved, that it possesses true fattening properties—that it acts as a food. A substance, which may be considered intermediate in chemical composition and properties between ordinary fats and oils and glycerine, has recently been used to a considerable extent in phthisis as a nutrient and alterative,—as a substitute for cod-liver oil. I allude to the substance called "coco-oleine," or cocoa-nut oleine, which is obtained by pressure from cocoa-nut fat or oil, and subsequently purified. It has been prepared by Price's Patent Candle Company, for use chiefly at the Consumption Hospital at Brompton, where it was introduced by Dr. Thompson. It has likewise been tried throughout the country; but it has been found very liable to produce nausea and gastric derangements. For this reason, its use cannot be long persevered in; and, moreover, it is expensive compared with cod-liver oil. Thompson found, however, that cocoa-nut oil increased the solids of the blood in the

same way as cod-liver oil. It has been objected that glycerine, from its composition, is not likely to be of the same service in medicine, or to have the same physiological effect, as cod-liver oil and other oils. This objection, however, probably arises from mistaken views regarding the active ingredients or principles of cod-liver oil. Dr. Garrod has recently suggested that the last-named oil acts simply in virtue of its oleine, he having found that the margarine, or solid portion of the oil, produced no marked result when administered internally, and that its use could not be persevered in. Chemically speaking, oleine, as we have already seen, is the oleate of glycerine; and, *à priori*, there are more numerous and stronger grounds for believing that the active principle is the glycerine rather than the oleic acid. Glycerine appears to have been tried somewhat extensively in phthisis as a substitute for cod-liver oil, but the results described are very contradictory. Dr. Crawcour of New Orleans used it in cases where the nauseous taste of cod-liver oil rendered it most obnoxious to the patient, and its administration therefore impossible,—with such success, that in the course of a year it had entirely superseded cod-liver oil in his practice. On the other hand, in 'Thomson's London Dispensatory' (1852), it is stated—"The editor some years since tried its powers as an internal agent, giving it chiefly to patients in whom the use of cod-liver oil was indicated, and in about the same doses, viz., from one to four drachms. The results of his trials were such as to induce him to put but little reliance upon its efficacy. In some cases it appeared to allay the cough of phthisical patients, but no very marked improvement could be found to follow its use." "All reason and analogy," says Dr. Garrod in the review before quoted, "and the little clinical observation yet obtained, are against the idea of its acting similarly to cod-liver oil." I have had no opportunity of trying its effects in phthisis, either when administered internally, or when applied by the endermic method. But experiments on its use in this protean disease, would undoubtedly serve to dispel the contrariety of opinion which at present exists. It has been remarked to me by those who have tried it, that it does not allay the phthisical cough; nor do we expect that it should, at least immediately or directly. But it appears to have proved serviceable in other strumous cases. Dr. Stirling gave it in doses of three teaspoonfuls daily, along with one half-grain of quinine, for a period of three weeks, to a delicate, emaciated, cachectic, strumous boy of eight years; the improvement in general health was most marked and rapid. Dr. Deighton of Clapham [Lancaster] reports marked good effects from its use in chronic gastritis; and Mr. Wilson mentions a case of affection of the mucous membrane of the stomach occurring in the practice of an Edinburgh physician, in which it "appears to have worked wonders," in the dose of three tablespoonfuls per day. Dr. Browne of the Crichton Royal Institution for the Insane, Dumfries, has kindly favoured me with the particulars of several cases in which he has used it internally—including phthisis, strumous abscess, pulmonary abscess, chronic

bronchitis, and general cachexia. In one case a strumous abscess cicatrized rapidly and satisfactorily under its use. In a case of phthisis, where ordinary aliments and remedies were refused or swallowed in too small quantity to support life or health, it appeared for a time to take their place. In other cases, in which it was used internally, the results were inappreciable or nugatory.—*Edinburgh Med. Journal, Sept.* 1856, *p.* 207.

19.—HOURLY PULSATION AND RESPIRATION IN PHTHISIS, WITH ITS RELATION TO SLEEP, FOOD, SUNLIGHT, &c.

By Dr. Edward Smith. (Read before the Royal Medical and Chirurgical Society.)

The author commenced his paper by stating that this investigation was made in June, 1855, and embraced the rate of pulsation and respiration at each of 144 consecutive hours, or six days and nights, in three women and three men, aged twenty, twenty-two, twenty-two, forty, forty-one, and forty-five years, all of whom had cavities in the lungs, but were able to take sufficient food and exercise. The rate was ascertained in the recumbent position, and for this purpose the patients were required to lie down five minutes before each hour. The author first discussed the rate of pulsation, and then that of respiration; and under each head considered the rate both absolutely and as influenced by disturbing causes. The paper was accompanied by numerous tables and diagrams. He ascertained that pulsation is lowest from one to five a.m., and highest from ten a.m., to ten p.m. The effect of sleep is to lower pulsation, and of food commonly to raise it; but the rate of the pulse was increased if the patient rose earlier than usual, without taking breakfast at an earlier hour; but with early rising the rate is reduced in the after part of the day and in the day taken as a whole. The variations in the temperature of the hospital at different hours were very slight, and did not appear materially to influence the pulse. Moderate and gentle exercise also produces little effect, while sunlight powerfully excites pulsation. Respiration in phthisis is constantly much more rapid during the night than in the day; food also produces a well-marked effect in increasing the frequency in respiration. There is a closer correspondence between the temperature and respiration than between temperature and pulsation; but the hours of maximum and minimum respiration did not accord with those of temperature. The effect of sunlight upon the respiration in phthisis appeared to be null. The ratio of the rate of respiration to that of pulsation in phthisis, varies with every hour of the day and night; but it is highest in the night, when the pulsation is the lowest, and the respiration highest. The lowest ratio observed was 1 to 5·8, and the highest 1 to 1·4. The author

inferred from his investigations that, as profuse perspirations occur in phthisis during sleep, and as in both day and night sleep the pulse is lowered, and to a very great extent in the night, he considers that the former may much depend upon the latter; and acting upon this impression, he has exhibited food during the night with great advantage in preventing perspirations. As day sleep does not depress the pulse so much as night sleep, the perspirations may be somewhat prevented by curtailing the latter and encouraging the former. He also recommends early rising, care being taken to exhibit food accordingly. Too much sunlight should be guarded against in summer, while its deficiency in winter, and in close dark streets and alleys, is likely to maintain the state of low vitality which is so essential a part of the disease. The low state of pulsation maintained by many hours of darkness, with the increased ratio of perspiration during sleep, indicate the necessity for the administration of nutritious food during the night; and this will also allow the meals taken during the day to be moderate in quantity, and so lessen the unnatural day elevation of the pulse. This might also be accomplished by exhibiting oleaginous substances, as the cod-liver oil, the last thing at night. The author thought that the aim should be, to increase respiration disproportionately to pulsation. This may probably be effected by remedies which give tone to the system; but it is shown to be accomplished by food, and especially by sleep. Hence the due cultivation of the horizontal posture, with frequent food and day sleep, are indicated; early retiring to rest had also the same effect. The author referred to the low ratio of respiration to pulsation, which had been found to exist in persons of unusual stature, and in the early stage of the disease.

In reply to several observations, Dr. Smith said that he had made another investigation, which was about to be published, in which would be found an answer to many of the questions asked; but in this investigation the object was less to determine the precise effect of any article of food than the effect of meals as they are ordinarily taken by the community. He had proved that animal food was a powerful stimulant; but he believed that tea excites the pulse and breathing more than any other ordinary kind of food. In his inquiries, the question of temperature had been carefully separated from that of sunlight; and his statements as to the latter was quite independent of the former. Hot climates may be of benefit where there is an irritable condition of the lung. His deductions had rather reference to the improvement of the general system; and he had ascertained by another inquiry, that those who bear heat well in health, have but little increase of pulsation from increased temperature, and therefore do not suffer materially from hot climates; but those who bear heat badly, have largely increased pulsation from heat, and are injured by hot climates. In such investigations, the number of persons under examination must necessarily be very limited. In this one it occupied half an hour to make

the inquiries for him in the six cases, leaving but very little time to the inquirer for repose; but by continuing the inquiry for a lengthened period, the disadvantage is lessened.—*Association Med. Journal, March* 29, 1856, *p.* 256.

20.—ON THE SPIROMETER.

By Dr. Hutchinson.

[We cannot give a more striking example of the diagnostic value of the measurement of the breathing capacity by this instrument, then by quoting the case of Freeman, the American giant.]

This man came over to England in 1842, and in the November of that year, trained for a prize fight. I examined him immediately before his *professional engagement*, when he might be considered in the 'best condition.' His powers were as follows:—Vital capacity, 434 cubic inches; height 6 feet 11½ inches; weight 19 stone 5 lbs.; circumference of his chest, 47 inches; inspiratory power 5·0 inches; expiratory power, 6·5 inches. In November, 1844, exactly two years afterwards, he came to town in ill-health. I then examined him in the same way as before, twenty times, at various intervals, during which his vital capacity varied from 390 down to 340, and the mean of all the observations was 344 cubic inches—a decrease of 90, or more then 20 per cent. His respiratory power had decreased one-fifth, and his weight 2 stone in the whole period. At this time I took him to two physicians well skilled in auscultation, and they both affirmed that they *could not detect* any organic disease. After January, 1845, I lost sight of Freeman; and in the October following, I was kindly favoured with the following account of him from Mr. Paul, surgeon to the County Hospital, Winchester:

"Freeman was admitted into this hospital on the 8th of October, in an extreme state of debility and exhaustion; he was reduced almost to a skeleton, complained of cough, and was expectorating pus in large quantities. Percussion on the anterior part of the chest, *under the clavicles*, gave on the right side a very dull sound; on the left one much clearer, but still I think, less resonant than natural. I made but one attempt at auscultation, but could come to no conclusion, for a rather singular reason—the ribs were so large, the intercostal spaces so wide, and so sunk in from the extreme state of emaciation to which Freeman was reduced, that I could not find a level space large enough to receive the end of the stethoscope—could not in short, bring its whole surface into contact with the chest. Freeman's great debility, and the clearness of the diagnosis from other sources, prevented my repeating the attempt. Freeman after death measured 6 feet 7½ inches. and weighed 10 stone 1lb. On opening the chest, the lungs on both sides were found adhering by their apices to the superior boundaries of the thorax, and studded throughout

their substance with tubercles. The tubercles, on the whole, were much less numerous in the right lung than in the left; both lungs were nearly healthy at their base; the tubercular matter gradually increased in quantity towards their upper parts, and the apices of both lungs were almost completely occupied by large cavities partly filled with pus, and capable of containing two or three ounces of fluid each."

This one case is sufficient of itself to show the importance of the spirometer in detecting the incipient stage of pulmonary disease, at a period when the other physical means of diagnosis are incompetent to the task. We may add a few words upon its use, and upon the results that have been obtained by its agency.

We have already drawn attention to the opinion of Hutchinson, that the vital capacity of a healthy individual depends principally upon stature, weight, and age, and is most powerfully influenced by the first. So intimate, indeed, is the connection existing between the stature of the body and the capacity of the thorax, that for every inch of height (from five to six feet) eight additional cubic inches of air, at a temperature of 60° Fahrenheit, are given out by a forced expiration. The second element, weight, is of minor importance, and cannot be so easily estimated, inasmuch as the weight of an individual increases with the height. In order to obtain the true relation between the weight of the body and the vital capacity of the lungs, Hutchinson first attempted to fix the average normal weight for a given stature, and then proceeded to compare the result with the amount of air expelled by a forced expiration. Numerous observations on this point led him to the conclusion,

"That the vital capacity increases nearly in the ratio of one cubic inch per pound from 105 to 155 lbs.; and that from 155 lbs. to 200 lbs. this increase is overpowered, and there is a loss of thirty-nine and a half cubic inches, as the effect of weight. Therefore all weight under eleven stone and a half does not interfere with the vital capacity; but on the contrary, it increases with the weight up to this point; but above this weight, so far as our table goes (namely, to fourteen stone), the weight interferes with the vital capacity, preventing this increasing progression in the relation of rather more than one cubic inch to the pound. . . . The weight of man naturally increases with the stature, therefore the relation between the weight and the vital capacity must also vary at different heights."—*British and Foreign Medico-Chirurg. Review, July*, 1856, *p.* 87.

DISEASES OF THE ORGANS OF DIGESTION.

21.—ON VARIOUS AFFECTIONS OF THE STOMACH.

By Dr. G. Budd, F.R.S., Prof. of Medicine in King's College Hospital.

1. *Excessive Secretion of Mucus and Gastric Juice.*—When there is an excessive secretion of mucus or gastric juice, bismuth may be

administered before meals with advantage. An excess of acid in the stomach (which by the way, often occasions a great repugnance to food) may be neutralized by lime water or magnesia. Associated with the development of the acid, there is usually an evolution of carbonic acid, resulting from a process of gastric fermentation, which may be checked to a certain extent "by brandy, and by dill-water and other aromatics, combined with bismuth, or with alkalies, when these are necessary." When there are fetid eructations, containing sulphuretted hydrogen, creosote pills (containing from a quarter to half a minim) may be given with each meal; or a few grains of bisulphite of soda; or some finely-powdered wood-charcoal. Finally, "to alleviate pain, and to allay general nervous irritability, the medicines most in repute, and probably the best, are conium and belladonna, which have the advantage of not confining the bowels and checking the secretions, as opium does."

2. *Sympathetic Vomiting.*—"Functional disorder of the stomach, may result not from organic disease of the stomach merely, but from organic disease of other organs; and that, not by the constitutional disturbance which this disease sets up, or by any change it may cause in the blood, but by an influence transmitted through the nerves. . . . Irritation of the lung, or of the brain, or of the liver, or of the uterus, from certain kinds of organic disease, frequently leads, as is well known, to *sympathetic* vomiting—that is, to vomiting caused by nervous influence reflected from the seat of disease upon the muscles which perform this act. The matter vomited in such cases is frequently acid, even when digestion is not going on . . . . whence we may safely infer, that the reflex nervous influence excites, not merely the act of vomiting, but also, in many cases, a secretion of gastric acid."

This sympathetic gastric disease is very commonly seen in phthisis. In this disease, vomiting generally occurs sooner or later, and the functions of the stomach are otherwise disordered. Disorder of the stomach of a similar nature sometimes originates in the liver, especially from the irritation caused by the passage of gall-stones, or by hepatic abscess. It may likewise result from disease of the brain, especially from inflammation of that organ or of its membranes. Andral, who has investigated this subject with much care, and whose results are quoted by Dr. Budd, observes, that "vomiting, or at least nausea, very frequently attends acute inflammation of the membranes of the brain. These symptoms show themselves almost exclusively in an early stage of the disease, and they often mark its onset." Gastric disorder of this kind results very frequently from irritation or organic disease of the uterus. It has been observed when, in tying a polypus, a portion of the uterus has been included in the ligature; it occasionally occurs in women afflicted with cancer of the uterus—an effect, doubtless, of reflex nervous influence; and it is sometimes observed when miscarriage is about to take place; and in conjunction with chronic ulcer of the neck of the womb. In children, the

irritation of teething is a frequent source of this variety of gastric disorder.

"The most effectual remedies for the disorder are,—

"1. Sedatives, and other means which lessen the irritation from which the gastric disorder springs.

"2. Alkalies and astringents.

"Alkalies sometimes give immediate relief, by neutralizing the acid which the stomach contains: astringents alleviate the disorder rather more slowly, but for a longer time, by restraining the undue and untimely secretion.

"The insoluble antacids—magnesia and chalk—are well suited to this disorder. They serve to neutralize any excess of acid that may be in the stomach; and given under these circumstances, have an astringent action on the surface besides.

"Bismuth has a remarkable effect in restraining undue secretion in the mucous membrane, and may often be given with advantage, either alone or in conjunction with magnesia or chalk.

"When the disorder continues, the diet should consist chiefly of milk and farinaceous food, and little should be eaten at a time. Alcoholic drinks and all stimulating articles of food seldom fail to aggravate the disorder, and should be strictly forbidden.

"If symptoms indicating an inflammatory state of the stomach should occur—namely, a sense of heat in the stomach, and pain excited by food, tenderness at the epigastrium, and a white coat on the tongue, a blister or mustard-poultice may be applied to the epigastrium; and the stomach may be cooled, and be rendered less irritable, by swallowing occasionally, and especially after meals, a small lump of ice.

"If constipation exist, it may be remedied by medicines, such as pills of colocynth or aloes, which do not much offend or oppress the stomach.

"In some cases of this sympathetic disorder all these means are unavailing: nothing will stop the vomiting while the original irritation exists."

3. *Deficient Secretion of the Gastric Juice.*—A too scanty secretion of the gastric juice may arise from various causes. According to Dr. Chambers, "There is no defect, moral or physical, so frequently handed down from parent to offspring, as the inability to form a sufficiency of this secretion." Next to hereditary predisposition, we must place overwork of the mind, prolonged anxiety, ambition, &c.; and finally, gluttony, drunkenness, and, in a lesser degree, indolent and sedentary habits, and the consumption of more food (without positive gluttony) than the system, with so little tear and wear, requires. From any of these, and probably from various other causes (as, for instance, glandular degeneration, a subject which has recently been most ably investigated by Dr. Handfield Jones), it may happen

that the gastric juice is not secreted in sufficient quantity for the purpose of digestion, and that consequently indigestion will ensue.

The signs of a deficiency of the gastric juice are (according to Dr. Chambers):

1. An arrest of the food in the stomach.
2. Distress after eating albuminoid substances.
3. Decay of albuminoid substances in the alimentary canal, and consequent fetid gases arising from that decay.
4. The appearance of unaltered muscular fibre in the stools.

The food in these cases remains undigested, or only partially digested, in the stomach, for a much longer time than the normal period—sometimes for twelve or even twenty-four hours; and during this slow process there comes on a sense of weight or uneasiness at pit of the stomach, which gradually disappears as the food becomes dissolved and escapes from the stomach.

"If (says Dr. Budd) portions of food remain undigested many hours, they irritate the lining membrane of the stomach, and cause headache, a slightly furred tongue, and feelings of general disorder.

"Not unfrequently this irritation of the stomach checks secretion in the liver, so as to render the complexion somewhat sallow; and in nervous persons who dine late it greatly disturbs the sleep.

"When, from permanent weakness of the stomach, the digestion is habitually feeble, the body after a time is imperfectly nourished—the blood is poor in globules, the circulation is feeble, the extremities are apt to be cold, the spirits are depressed, and the various *powers* of the body decline."

The remedies for habitual slow digestion, consist fully as much in the proper regulation of the diet and general habits, as in purely medicinal agents.

In slight cases a little comparative starvation will do no harm, but when the affection is chronic, the patient may not be in a state to bear starving; and in fact the disease might be aggravated by thus lowering the system. Under these circumstances, Dr. Chambers lays down the following rules:—1. To let the albuminoid food be as liquid as possible. 2. To let the quantity requisite for the day's consumption be taken at frequent short intervals; and (if it is likely to turn sour) 3. To guard it with alkalies. It is unnecessary to observe that Dr. Chambers's third rule is diametrically opposed to the ordinary mode of proceeding.

"I can hardly say (observes Dr. Budd), that when digestion is slow and feeble, care should be taken not to give, at the time of meals, or while digestion is going on, alkalies, the alkaline salts, or other medicines that suspend or enfeeble the action of the gastric juice."

By following Dr. Chambers's third rule, we may get the food to pass unaltered into the intestines, and by trusting to their digestion, spare the stomach without starving the patient. We have great pleasure in directing the attention of our readers to these rules, not

only because we believe them to be of sound practical value, but because they afford an excellent illustration of the direct service rendered by physiology to the treatment of disease. If it had not been for the physiological experiments of Bidder and Schmidt, and of their pupil Zander, we should never have known that the intestinal juice possesses the remarkable and unique property of dissolving and rendering fit for absorption, not only flesh and the other albuminoid bodies, but also starch—in short, that it unites in itself the powers of the acid gastric juice and the alkaline pancreatic fluid. The following recommendations are also based on the physiological observations of Bidder and Schmidt :—

"The gastric juice may in part be replaced by water drank ; and hence we often find a draught of this liquid, an hour or two after meals, will remove the discomfort arising from difficult solution of meat meals. It is not merely the dilution of pungent irritating matters which is effected by these means, but the solution, and consequent absorption, of the delayed nutrimentary mass.

"The comfort arising from drinking a short time after meals, has originated the custom of tea and coffee soon after the evening dinner. The liquids taken are, however, not nearly so well suited to the purpose as pure cold water is, and many sufferers from sluggishly-secreted gastric juice will find from this latter beverage a relief which tea or coffee can never give.

"The water may be made pleasanter by being iced, without any consequent injury to digestion, for we know, from Drs. Bidder and Schmidt's experiments, that the freezing temperature does not arrest the functions of the gastric juice, and probably, too, the cold gives a tone to the stomach which its torpid congested condition requires.

"Another addition to the water, not unpalatable, is a few teaspoonfuls of a solution of the superphosphate of lime, which is at the same time a condiment or fillip to digestion, and a complementary food.

"A lemon-water ice is another agreeable substitute for tea."

The solution of the superphosphate of lime may be prepared, as Dr. Chambers informs us in a note, "by adding to the pharmacopœial solution of chloride of calcium, the rhombic phosphate of soda, and then redissolving the precipitate formed, by the addition of phosphoric acid. The chloride of sodium in the solution only makes it the more sauce-like."

With regard to medicines, Dr. Budd especially mentions ipecacuanha, rhubarb, and cayenne pepper, as substances which, by stimulating the lining membrance of the stomach, cause an increased flow of gastric juice.

"From half a grain to two grains of ipecacuanha, and three or four grains of rhubarb, or a grain of capsicum with three or four grains of rhubarb, in a pill, may be taken before dinner, or before breakfast and before dinner. . . . As a remedy for frequently-

recurring slowness of digestion, ipecacuanha seems to me to be more effectual than any of the other stimulants. . . . Where digestion is habitually slow and feeble, much benefit of more lasting kind may frequently be derived from the muriatic or the nitro-muriatic acid, taken for some weeks together, half an hour or three parts of an hour before the principal meals."

4. *English Cholera.*—"Severe attacks of vomiting and purging, commonly designated English cholera, seem often the result of fermentation or putrefaction of food in the stomach, by which some highly-irritating matter is formed. If I may judge from my own experience, such attacks generally come on in the evening, soon after dinner, or at night, soon after supper, and are much more frequently consequent on a meal of meat or cheese than on the eating of fruits, to which, perhaps from the greater frequency of the disorder in autumn, they are generally ascribed. I have found no remedy so effectual in checking the disorder as pills composed of creosote and opium."

5. *Pyrosis.*—For all practical purposes, we may regard it as dependent on two general causes—namely, (1) pregnancy, enlarged liver, or some other condition that disturbs the functions of the stomach; and (2) a defective diet, the fault most commonly being, that it consists too much of farinaceous substances. In the latter case, the treatment is chiefly of a dietetic nature, and little benefit can be expected from a purely medicinal treatment.

The medicines that have been found most useful in pyrosis, are (1) *astringents*, as bismuth, lime-water, kino, catechu, logwood, &c.; and (2) *sedatives*, especially opium and the salts of morphia. Medicines of these two classes may often be combined with advantage. As illustrations of such combinations, Dr. Budd mentions five grains of bismuth with a twelfth of a grain of the muriate of morphia, or five grains of the compound kino powder, or an efficient dose of catechu, krameria, or logwood, with opium, to be given before meals, two or three times daily.

Other medicines have at different times obtained a reputation for curing pyrosis, which cannot be strictly classed either with astringents or sedatives; as, for instance, "nitrate of silver, which may be given in pills, in doses of half a grain, three times a-day; nux vomica, which may also be given in pills, in the dose of from three to five grains, three times a-day; quinine; and the mineral acids."

When, as is often the case, the pyrosis is connected with anæmia, steel is of great service, both in removing it and preventing its recurrence.

6. *Indigestion of Drunkards.*—When it results solely from spirit drinking, its chief characters are—

"Want of appetite, and vomiting or dry retching in the morning, with a white or furred tongue, and a slow pulse. The power of digestion is much enfeebled, and if the patient eat at any time what for others would be a very moderate meal, he is apt to vomit soon after-

wards, and to be troubled by pain in the stomach, and flatulence. . . This disorder, like the vice from which it springs, is most frequent in men of middle age, and is generally associated with more or less of that strange and peculiar disturbance of the nervous system which hard drinking brings on, and of which the most striking effects are inability to sleep, or sleep broken by frightful dreams, despondency in the morning, and tremulousness of the hands and tongue."

This kind of disorder is very common among the poor of large towns, and sometimes is so severe as to lead to the suspicion that organic disease is present.

The most efficient remedies are bitters, opium, and solid food. Gentian, quassia, and calumba may be taken, singly or combined, in the form of tincture, two or three times a-day, an hour before the principal meals. With these bitters, small doses of opium or of morphia may be very advantageously combined, so as to tranquillize the nervous system, procure sleep, and settle and strengthen the stomach. It occasionally happens, however, where the gastric disorder is severe, that very large doses of opium are requisite. Dr. Budd describes such a case, in which no decided amendment took place during a four month's residence in King's College Hospital, till half a grain of muriate of morphia and five minims of dilute hydrocyanic acid were given every four hours.

"This soon stopped the vomiting, and gave him a full measure of sleep, and the appetite returned. He continued to take the morphia in very large doses, in conjunction with hydrocyanic acid; steadily grew stouter and stronger; and at the end of some weeks left the hospital to resume his accustomed labour."

In all these cases it is essential that the patient should eat as soon as possible some solid nourishing food.

7. *The Vegetable and Mineral Tonics.*—"The most important medicines of this class are the vegetable bitters—quinine, gentian, calumba, strychnine—and the different preparations of iron. Quinine and the bitters generally, are especially grateful to persons who have injured their stomachs by hard drinking. With such persons they improve the appetite and strengthen digestion, and have a bracing effect upon the system at large. In persons exhausted by over-work, or wherever weakness of the stomach is the result of general debility from other causes, they often do much good in the same way—*by improving the appetite* and strengthening digestion. They do harm in organic diseases of the stomach; in plethoric states of the system; and generally where there is a furred tongue, or where the urine throws down a sediment of lithic acid or of lithate of ammonia. Their most striking effect is, to improve the appetite, when this has been impaired from hard drinking, or from over-work, or from nervous exhaustion from other causes; and the best time for giving them is from half an hour to an hour before meals. The different bitters have not precisely the same effect. Calumba has a sedative influence not possessed by the

others, and probably on this account has had a wider reputation as a remedy for mere indigestion. Gentian and chiretta (which is of the gentian tribe, and is much employed by practitioners in India) tend to increase the secretion of the liver, or at any rate do not impede its secretion, which quinine and quassia seem often to do. They are therefore better suited to bilious persons, and to those cases of indigestion where the secretions of the liver are defective. The different preparations of steel are especially useful in the indigestion that occurin chlorosis, and generally where weakness of the stomach results from anæmia. They do harm in plethoric states of the system, and generally where there is a furred tongue, or where the urine throws down a sediment of lithate of ammonia or of lithic acid. The citrate, or ammonio-citrate, is the most agreeable preparation to the taste, and generally the most grateful to the stomach. If there be any disposition to sickness or nausea, or any tendency to furring of the tongue, it may be given in conjunction with the bicarbonate of soda or potash. This makes a mixture having much the same effect as Griffiths' mixture—the mistura ferri composita,—and far more agreeable. The muriated tincture of iron is more astringent than the other preparations, and may be given in conjunction with dilute muriatic acid, in the forms of indigestion suited to this latter medicine, when these exist in states of anæmia. The sulphate of iron, like the other metallic sulphates, has a tendency to cause sickness, and should not be given in cases where a disposition exists. Steel medicines do good by improving the quality of the blood rather than by their immediate action on the coats of the stomach, and are best given at meal-times. They then are mixed with the food, and gradually absorbed with the products of digestion, and are less apt to offend the stomach and to cause headache than at other times. Whenever steel medicines are given, it is essential that a regular action of the bowels be kept up. These medicines tend to confine the bowels and to cause evolution of sulphuretted hydrogen in them; and, unless this tendency be counteracted, they are apt to fur the tongue and cause headache."

8. *On the Employment of Alkalies.*—"It may, perhaps, be adopted as a maxim, that alkalies, given to exert their constitutional effect, are most frequently useful to persons who have dry skins and perspire little, and eat largely of animal food and live in towns; that acids are most frequently useful to persons who live in the country, eat largely of vegetable food, and perspire much. If there be one symptom more than another that suggests and justifies the use of soda, it is a furred or coated tongue."

9. *The Vegetable Astringents.*—"Chalk, and the vegetable astringents,—kino, catechu, krameria, and logwood—are generally given to restrain diarrhœa. It does not seem to be generally known that they are just as effectual, perhaps more effectual, in restraining undue secretion from the stomach. Chalk, like bismuth, from its sparing solubility, has little direct action, except on the mucous membrane

over which it passes. The vegetable astringents have a more remote astringent influence. This is clearly seen in the colliquative stage of phthisis; where, besides restraining the diarrhœa and stopping the vomiting with increased secretion of gastric juice that often occurs in this state, they restrain, often in a very striking degree, the profuse sweating. They seem all to have much the same effect. I generally give the preference to krameria and logwood. Kino is not conveniently given in solution; and catechu is not only very nauseous, but, from being much used in the arts, is often of inferior quality. The most grateful to the taste is krameria; the most effectual, I believe, is logwood. Logwood has a mawkish taste, which is best corrected by cinnamon. An ounce of logwood shavings, and a drachm and a half of powdered cinnamon, may be infused for four hours in ten ounces of boiling water, and then strained. An ounce and a half of the strained infusion may be given two or three times a day, a short time before meals."—*British and Foreign Medico-Chirurgical Review, July*, 1856, *p.* 40—49.

22.—ON THE TREATMENT OF ULCER OF THE STOMACH.

By Dr. William Brinton, Physician to the Royal Free Hospital.

[The purposes which we must endeavour to fulfil in the treatment of this disease are: to remove all local obstacles to the cicatrization of the ulcer; to support the constitution in this process; to remedy the results the lesion may already have brought about; and to arrest some of the prominent symptoms which may exist. The question of bleeding is one that might almost be left unnoticed, save by a simple protest against either the general or local forms of depletion.]

Blisters, turpentine stupes, mustard poultices, dry cupping, and hot fomentations, are exceedingly useful adjuncts of this kind to internal remedies. The symptom which seems to me chiefly to demand the application of such means is chiefly that of pain, especially of that continuous gnawing pain which, in severe cases, sometimes occupies even the intervals of taking food. The epigastrium is generally the most convenient site for applying them. But when the chief pain is referred to the dorsal spine, it will often be found more effective to choose this region for their application. As regards the particular agent to select, the above enumeration tolerably represents the order of their severity. Blisters are generally most useful in young and well-nourished subjects, and in comparatively recent cases, when they are not by any means contra-indicated by pallor of countenance: the less so, indeed, that this symptom appears sometimes to be partially due to gastric intestinal congestion. Tartar emetic is rarely or never advisable: it is too painful and troublesome; lowers the patient too much; even if it does not sometimes give rise to other and more specifically antimonial effects on the system. Turpentine and mustard,

which avoid even that limited expenditure of the *liquor sanguinis* that the serous effusion of a blister involves, are preferable in old and chronic cases where the strength is reduced, and have the further advantage of being repeatable at shorter intervals of time. Lastly, in cases where the powers are exhausted by constant vomiting, and where (what is rarely the case) the pain still forms a very prominent symptom, dry cupping is the best means of mitigating it. Indeed, it is efficacious in those depressed and languid states of the circulation, when even turpentine or mustard have lost much of their effect.

One unpleasant consequence of such applications I may mention, though it would rarely afford a definite and practical contra-indication of their use. In two instances that have fallen under my notice, in which the necropsy revealed old adhesions between the stomach and the wall of the belly, blisters gave rise to a marked increase of the pain. A somewhat similar uncertainty attends the application of hot fomentations to the epigastrium, since in many instances these seem to increase the pain by raising the temperature of the subjacent parts, including the seat of the lesion.

A still more valuable remedy, of precisely the opposite kind, may be often found in the local application of cold by means of ice. In many cases of obstinate vomiting or severe pain, great relief may be obtained by frequently swallowing small lumps of pure ice. And in cases of hemorrhage its use is almost indispensable. Here, too, it is sometimes advisable to apply it externally, by means of a bladder partially filled with powdered ice, and kept in contact with the epigastrium for a few minutes at a time.

The drugs recommended for the relief of this malady are so numerous and diverse, that it is scarcely possible to avoid some classification in treating of them. And considering how moderate is our acquaintance with the action of many of them on the healthy or diseased organ, the only justifiable approach to a classification is one that considers each with relation to those special symptoms which experience seems to show that it can relieve. Here, as in many other diseases, we must both choose and classify our remedies on an empirical basis, and use their known physiological and pathological effects chiefly as means of suggesting their trial, explaining their action, testing their efficacy for the disease in general, or forbidding their application in the particular case. To accord to our limited knowledge of this kind a higher function than such a suggestive and deliberative one, would often lead us to overlook, or even refuse, excellent remedies. To rate it at a lower value, would soon lead us to confound recoveries and cures, and thus repeat the most dangerous (because the most seductive) fallacy of homœopathy.

The relief of severe and continuous *pain* is best effected by sedatives, and especially by opiates. The form in which these may be best administered is determined chiefly by the state of other symptoms. Where severe pain is accompanied by very frequent vomiting, a very

small pill of solid opium, or of the watery extract of this drug, is often better retained than any other form of opiate. Where diarrhœa is present, the compound kino powder is an excellent remedy; with which we may combine what is calculated to allay both the flux and the pain—the trisnitrate of bismuth.

There are, probably, few drugs which have enjoyed a more durable or extensive repute than this preparation of bismuth in many gastric affections attended with much pain. In the "morbid sensibility" of the older writers, (a form of dyspepsia, which there can be no doubt will always include a certain proportion of gastric ulcers, and which probably included a still larger number when this disease was comparatively unknown to the physician), the bismuth is constantly praised as an efficacious sedative. And my own experience quite corresponds to that of other observers in this respect. In doses of from ten to twenty grains, at intervals of six or eight hours, either alone or in combination with five to ten grains of the compound kino power, it has often had a remarkable effect in relieving the pain, vomiting, and diarrhœa so frequently present in this malady.

The mention of this preparation of kino seems to demand some allusion to the other vegetable astringents. Diarrhœa is so seldom a dangerous symptom of gastic ulcer, that they will rarely be indicated in this way. And their value as tonics is greatly diminished by their tendency to cause constipation, as well as by the gastric irritation that large doses in the liquid form often excite in the ulcerated stomach. They have, however, being commended in what is called *pyrosis*, with the plausible notion of checking that excessive secretion from the stomach, to which this watery vomiting is supposed to be due.

The frequency with which pyrosis occurs in ulcer of the stomach, renders it advisable to correct the errors implied in the above statement—errors which evince, not only ignorance of physiology, but carelessness in making assertions that ought to form the result of pathological inquiry. Without going quite so far as to affirm that the secretion of the stomach is, under all circumstances, acid, we may safely assert that there are no sufficient reasons for believing that it is ever otherwise. And except in those rare instances in which the fluid vomit of pyrosis consists chiefly of ingesta, a careful chemical and microscopical examination will generally show that it is composed almost exclusively of saliva, which, often poured forth in increased quantity as the result of gastric irritation, is conveyed into the stomach, either by unconsciously trickling down the œsophagus, or by being propelled through this tube in the usual process of deglutition.

It is not easy to give any satisfactory explanation of the operation of bismuth in these cases. To say that it is a sedative, is merely to express, by a vague generalization, its efficacy in relieving pain; and is neither more or less correct than it would be to call it an astringent,

because, in other diseases, it often restrains and checks diarrhœa. How far both these effects are akin to those of the salts of lead, is difficult to determine, though its affinity to the latter in some other respects may partially suggest such a comparison.

Thus there can be little doubt that it is often decomposed by the sulphuretted hydrogen of the alimentary canal, and converted into a black sulphuret of the metal. And in one or two instances, I have assured myself that its administration has given rise to the formation of a bluish-red line along the dental edge of the gums analogous to (but less intense than) the line of sulphuret of lead in the same situation, which constitutes the well known test of the presence of lead in the system.

It is not often that *flatulence* constitutes a very distressing or prominent symptom of gastric ulcer. Depending, as it does, almost solely on a decomposition of the food introduced into the alimentary canal, unchecked by the agency of the gastric and intestinal secretions by which it is normally limited and restrained, its presence in gastric ulcer implies a derangement of these secretions, which is not by any means necessarily or often present. While a still more efficient reason for its absence is found in the fact, that any food in excess of what the quantity and quality of the secretions can digest, is pretty sure to give rise to an act of vomiting, by which it is soon expelled from the stomach.

We do, however, sometimes find cases of gastric ulcer, in which the long interval that precedes the worst attacks of pain after food, and the extreme distension complained of by the patient, refer the symptoms, at least in part, to this passive origin. It is chiefly in these cases that the remedies usually administered for the common or flatulent form of dyspepsia, appear to be most serviceable. Amongst these, we may enumerate the alkaline carbonates, (preferably the bicarbonate of potash,) the action of which seems to depend in great degree on their neutralizing the lactic and other acids developed by gastric decomposition; and the hyposulphite of soda, which appears to have a specific influence in checking that development of confervoid growths that constitutes (or, at any rate, invariably accompanies) the more complete forms of fermentation in the contents of the stomach. With the former I have found it advantageous to combine small doses of the iodide of potassium. And of all the bitter infusions, I have found none so beneficial, in this flatulent nausea, as the calumba. The subjoined formula is one that I have frequently prescribed, with the best effect, in the flatulent dyspepsia of gastric ulcer.

℞. Potassii iodidi, gr. i.; potassæ bicarbonatis, gr. xv.; tincturæ aurantii, ℥ss.; infusi calumbæ, ʒ viiss. M. Horâ secundâ post cibum sumitur.—*Lancet, Oct.* 11, 1856, *p.* 399.

23.—ON CANCRUM ORIS.

By Dr. James Gray.

[This is a disease pe[illegible] to childhood, but it is not confined exclusively to the chil[illegible] of the poor, as some authors assert.]

All the cases which have been recorded, as well as those that have come under my own personal observation, have been preceded by some other malady, as measles, croup, hooping-cough, &c., followed by bilious diarrhœa, the effect of which is, to drain the liver of the secretion which must be supplied to that organ from the disintegration of the tissues, the sulphur of which goes to the production of bile; and where the supply of food, from loss of appetite, or any other cause, is not equal to the demand, ulcerative absorption is the consequence. Such is the view I take of cancrum oris—a state of the system where there is a deficiency of sulphur, and of which the treatment is comparatively simple, if the case is taken in time before exhaustion sets in.

The better to elucidate this theory, I shall make a few preliminary observations before proceeding to detail the symptoms and modes of treatment of the disease in question. Sulphur enters into the formation of all the tissues of the body, and has been found in the urine and saliva. While Gorup-Besanez has determined the composition of the epithelium to consist of $2\frac{1}{2}$ per cent. of sulphur, Redtenbacher has discovered that taurine, one of the products of the bile, shows it in the proportion of 26. Bile is formed by the transformation of the tissues. A portion of its sulphur is expelled along with the debris of the food, the remainder re-enters the circulation, and is again made use of for repairing the waste constantly going on. In death from starvation, the gall-bladder is found distended with bile; thus proving that this secretion is derived from the metamorphosis of the tissues. In jaundice, however, although the bile in the liver is separated from the blood, it is yet prevented by some cause from entering the duodenum, is absorbed, and imparts its peculiar hue to all the tissues and secretions, while its absence in the bowels is attended with constipation and clay-coloured stools.

Children in health are constantly adding to their organism. While they take a larger proportion of food than adults, they consequently require an equally greater amount of bile. Finally, convalescence is frequently retarded, or altogether prevented, by irregularity of diet or drastic cathartics, which act particularly upon the liver, draining it of its secretion.

These facts premised, we come to consider the symptoms of cancrum oris, which I shall illustrate by three cases, two of which were treated in the generally approved mode, the third by the remedies I have myself found most effectual.

The more prominent signs are—1st, The state of the skin, the heat of which is slightly increased in the first stage of the disease, but afterwards subsides and falls below the natural standard. The cheeks are

at first flushed, but gradually pale and assume a waxy or dusky appearance. 2nd, The stools are clay-coloured, and lose their natural odour; the bowels most frequently constipated, and when relaxed, the effete matter is often mixed with mucus, sometimes with blood. These clay-coloured stools, without the jaundiced appearance of the skin, indicate that the liver is at fault, and unable to perform its appropriate function. 3rd, The urine is of a pale straw-colour, light specific gravity, and I have frequently observed an entire absence of the sulphates, as indicated by the chloride of barium yielding no precipitate. It also possesses a slight acid reaction, loaded with deposits, consisting of urate of ammonia, triple phosphates, and occasionally cystine. Dr. G. Bird considers this curious substance (cystine) to be, in all probability, a derivative of albumen, or of structures into which it enters, and resulting from derangement of the secondary process of assimilation. In commenting upon the similarity between taurine and cystine, both of which contain about the same proportion of sulphur, he says, "it appears by no means unlikely that the excretion of cystine may be a means of compensating for deficient action of the liver." 4th, Ulceration commences in the epithelium of the mouth, either in front of the frænum linguæ, or inside of the lips or cheeks, from any one of which points it spreads rapidly to the neighbouring tissues, till all are more or less destroyed. The ulcerated spots are surrounded by an erythematous redness. This redness depends upon the increased size of the intercapillary vessels, all of which have become so much enlarged as to admit a greater number of red globules, each containing a certain amount of oxygen, which acts an important part in the oxidation of the sulphurized tissues.

A little girl, aged 5, living in a healthy locality, on recovering from scarlet fever, began to be worse, and complained of her cheek, which was found hard and swollen; pulse was rapid, skin dry, tongue furred, &c. In a few days an ulcer the size of a sixpence was seen on the inner side of the cheek; this extended very rapidly towards the mouth and eyes, the patient became very much reduced, and died in about twelve days.

In another case of a child $2\frac{1}{2}$ years old, when recovering from bronchitis he became feverish, and a dark livid spot appeared on the inner side of the cheek; this sloughed and left a sore with an erysipelatous margin. In a few days the gums and tongue became implicated, part of the malar bone sloughed, the patient was very much depressed, pulse 144. In about three weeks from the commencement the opening in the cheek would allow two fingers being introduced into the mouth, pulse was 156, and the child died.

A child recovering from croup became fretful and feverish; an ulcer appeared on the cheek and lips of a dark livid colour; this spread for a time, but in about a week began to improve, and slowly recovered.

The treatment which I found, from personal experience, most successful, consists in the local application of a solution of the biborate of

soda, which acts, I believe, in neutralizing the sulphuric acid formed by the action of the oxygen of the peroxide of iron of the blood on the sulphur of the tissues.

The constitutional remedies are—

First—The tincture of aconite ("Fleming's"), in the proportion of six drops to the two ounces of water, of which mixture a teaspoonful is to be given every three or four hours, to subdue the vascular excitement which always prevails at the commencement of this disease.

Second—The tincture of nux vomica, in drop doses, is afterwards administered, to stimulate, through the medium of the nervous system, the secreting vessels of the liver, as also to prevent the deposition of the triple phosphate.

Third—The exhibition of sulphur, either in the form of milk of sulphur, or the sulphate of potass with sulphur, to supply the system with this element, in which it is deficient.

The diet should consist chiefly of the cold infusion meat, yolk of egg, fish, and the hydro-carbonaceous substances.—*Glasgow Med. Journal, April* 1856, *p.* 16.

24.—CASE OF CANCRUM ORIS.

By Dr. C. Fleming, Surgeon to the Richmond Hospital, Dublin.

[The patient, a little girl aged 4½ years, was admitted March 31st. Her mother states that she has always been healthy until about two days back, when she complained of soreness in the mouth. The left cheek, on examination, was found very much swollen and glossy, and there was a small, dark-coloured patch through which anything she drank dribbled through and down the cheek. There was sharp fever and great prostration.]

April 1st. The local symptoms are rapidly advancing; the slough has considerably increased, but portions of it appear more loose and flocculent. The surrounding swelling, tegumentary and glandular, is considerable, and when the child cries, the appearance of the countenanc is most ghastly.

I now determined to place the child under chloroform, to remove with care as much of the slough as I could, to apply to the exposed surface nitrate of copper, and to paint the circumference of the disease and surrounding cheek with collodion.

The effects of the chloroform were as rapidly as they were satisfactorily produced, and the requisite local objects were accomplished with the utmost ease, the child remaining perfectly placid throughout, without the slightest manifestation of suffering. With a view to anticipate any, when the anæsthetic effects of the chloroform passed off, five drops of Battley's solution were immediately given; the child fell into a tranquil sleep, awoke after some hours, and took nourishment, and the following medicines as directed:—

℞. Bicarb. ammoniæ, ℈i. or; gr. xx.; syrup. smilacis; syrup. cinchonæ (Donovan.); aquæ cinnamon. sing. ℥ss. M. Fiat mistura: signa. "One teaspoonful every four hours."

The dose of Battley to be repeated if pain or sleeplessness should recur. No interference with the local dressing.

April 2nd. Most satisfactory report. The child slept well, took its medicine and nourishment, and is no longer peevish and irritable. Her countenance is brighter, her fever less, and her bronchitic symptoms improved. Moreover, she now allows her cheek to be examined. There was no necessity to repeat the dose of Battley.

The improvement in the local symptoms is equally gratifying. The cheek is decidedly less swollen; the glandular fulness and tenderness are less; the sloughing has not extended, and the dressing on the surface of the phagedæna is dry. Principal discharge now is saliva.

Continue diet and medicine as before, and add beef-tea for nourishment. Renew the collodion around the cheek, but leave the application to the gangrened surface as at present, and soften the wadding with a little of the following liniment, warm :—

℞. Olei terebinth. ʒss.; aquæ calcis, olei amygdal. āā ℥ss.; M. Fiat linimentum.

3rd. Equally favourable report. The child now sits up in the mother's arms, and takes interest in amusements. She slept well last night without an opiate, has less thirst, took her medicine regularly, and feeds well on the diet directed. Most remarkable change in the local symptoms: coating of wadding on the phagedænic surface merely moistened by escape of saliva through the chasm in the cheek, and fœtor of discharge gone. Partial separation of the dressing from the surface near the upper lip, which has a clean granulating appearance. Skin surrounding ulcer and cheek almost free from any swelling, and glandular swelling so subsided that the outline of the jaw is now quite obvious.

Continue medicine and diet. Apply a light poultice of bread and milk over dressing. Reapply collodion. Opiate conditionally.

4th. All doing well. Slough all detached, and both mucous and cutaneous edges of ulceration free from any appearance of phagedæna, a circumscribed spot alone on the surface looking badly; remainder healthily granulating. I applied to the spot alluded to the nitrate of copper, and washed the remainder of the surface with a weak solution of it; applied wadding as before.

Medicine and diet as before, and Battley's solution to be given, if any pain be complained of.

Now, from day to day, rapid improvement took place. On the 8th the child was removed to its home; the ulcer remains healing most favourably, and merely requires the occasional application of nitrate of silver, as the sore might present any exuberant granulation.

This day (23rd April) the mother brought the child to the hospital, and the sore was healed to a mere point. There is so great contrac-

tion in the present stage of the ulcer, that a hope may be entertained that the deformity will be trifling. The red borders of the lip have nearly reached the site of the former angle of the mouth.

Remarks.—It may, perhaps, appear premature to record the above case; but I am anxious that local means, which I have found advantageous in more instances than one, of a very formidable disease, should be tested by those of my professional brethren whose special pursuits necessarily bring before them numerous cases of it, and whose experience must convince them of the too general failure of the treatment usually adopted. If we make an analysis of the case reported, and consider its symptoms in detail, at the same time reflecting on the pathology of the disease, it must be admitted that the diagnosis could not be otherwise than most unfavourable, and that the successful issue of ordinary treatment should be very questionable. I attach much importance to the use of chloroform in a case of the kind as a general agent, quite apart from its anæsthetic action, and I view the collodion as a most valuable provision to establish that wholesome capillary circulation favourable to healthy reparation. All local means must be considered as mere auxiliaries, and as subservient or subsidiary to general, in these affections; but it is most desirable that the destructive effects of caustic applications should be as limited and as superficial as possible, especially in a situation where any deformity is forbidding, and that cicatrization should be rapidly effected. Such perfection, nitrate of copper appears to me to possess. It cannot be used otherwise than in a fluid form, and it should be as it exists in its water of crystallization; it should be, as I have elsewhere noted, well mopped into the surface previously dried, and afterwards oil should be smeared over it.

I feel bound to state that the idea of the collodion suggested itself to me from observing the great value of the local application of the solution of gutta percha in chloroform, as recommended by Dr. Corrigan in his admirably practical lectures on the "Nature and Treatment of Fever" at certain stages of its local complications. I have extended this application to many surgical cases where unhealthy capillary congestion of the skin existed, such as around the bases of furuncular or carbuncular inflammations, and the benefit was immeasurable, provided that the directions of Dr. Corrigan were strictly attended to. In the present instance I select the collodion as I do in others, where a pellicle too consistent is to be avoided through fear of any traction, and where a very delicate skin is involved, and I consider it important that the surface of the application should be very extended, and that the painting should be renewed at short intervals. My object in the record of this case being exclusively with a view to the local treatment of cancrum oris in the stage of the disease which it presented, I abstain from remarks which might otherwise suggest themselves.—*Dublin Hospital Gazette, May* 1, 1856, *p.* 100.

25.—CLINICAL REPORT OF SOME OF THE USES OF THE CHLORATE OF POTASH.

By — Hutchinson, Esq., Surgeon to the Metropolitan Free Hospital.

[Chlorate of potash is a remedy which has long been known to the profession, but its virtues, and scarcely less than wonderful power in some cases, are not so widely appreciated as they deserve. We shall give some cases which may claim something of the character of demonstrable proof of its value, especially as the observations were made upon out patients of the Free Hospital, so that they could not be affected by change of air or any sanitary regimen.]

Some years ago I was in the habit—as I believe, indeed, most still are—of giving chlorate of potash in combination with bark or some other tonic; but latterly I have administered it in simple solution in water, without any combination whatever. Further, to escape deception, I have, in most instances, avoided the use of purgative or any other remedy, which might complicate the treatment, have given no directions as to diet, or, if asked by the patient to do so, have directed them to live just as they have been used to do.

The most convenient arrangement will probably be to take seriatim into consideration the several diseases, or types of disease, which the observations concern. To commence, then, with

Follicular Stomatitis.—This disease, marked by numerous round aphthous excoriations of a greyish-white colour on the tongue, lips, gums, &c., is not uncommon among children of all classes. It is attended with fever, and generally makes the mouth so sore, that for several days the patient is almost prevented from taking food. The breath seldom becomes fetid, and the gums are not generally either spongy or liable to bleed, these symptoms being reserved for a distinct and much more severe form of the affection. Follicular stomatitis is liable to prevail epidemically; and the first trial of the chlorate of potash against it which occurred under my observation was eight years ago in the city of York, where we had, for a month or two, a considerable prevalence of the disease. I took notes of a large number of cases, giving the remedy in five-grain doses, and generally using purgatives also. The success achieved was uniform, the symptoms almost always vanishing within the week. One morning, however, a girl, aged 10, was brought to me, presenting a most marked and severe form of it. She had had it four days, and two of her sisters had suffered before her. The usual prescription was given. Three days afterwards I called to see her, and, to my delight, found the most marked improvement. Many of the sores had healed; no fresh ones had formed; the febrile disturbance had quite subsided. While making a note of this pleasing result, the mother of the patient interrupted me with the information, prefaced by many apologies, that she had taken the prescription to three druggists, none of whom could make it up; and that, consequently, the child had only taken the

aperient dose, and never had the chlorate at all. It is needless to say, that I threw aside my series of cases in disgust, convinced that before I could investigate remedies I must know more about the natural course of the disease when uninterfered with. Since then I have allowed several cases of follicular stomatitis to take their course without treatment, and my conclusion is, that the disease is a subacute febrile disorder, of itself often transitory and spontaneously curable. My impression is, however, that it passes off more quickly, and that the troublesome soreness of the mouth is much sooner well, when the chlorate is given than when it is omitted; but this impression is, for obvious reasons, not easily susceptible of being converted into an established fact. This affection is one which, perhaps, concerns the physician rather than the surgeon. During the past year, however, eight cases have presented themselves in my room.

In four of them the disease was certainly of unusual severity. One reason for thinking that in all probability the chlorate did exert a curative influence is, that in all the benefit commenced within about the same time of its trial, and without regard to the stage of the disease. Thus in one the disease had only existed three days, in another, four, in three, seven, and in one, two weeks; yet all were far advanced in cure within three days of the use of the drug. The next class to which I shall pass is that of

Ulcerative Stomatitis.—It would not, perhaps, be warrantable to assert that this disease is in no case connected with the preceding, but, speaking generally, it is perfectly distinct from it. It affects unhealthy children, as a rule commences at a single spot, usually the lining of the left cheek. Its first stage is insidious, or, at most, subacute, and there is little or no premonitory febrile disturbance. The ulcer spreads gradually; its surface is covered with dirty, pultaceous secretion, and exhales an abominable fetor. The child appears to suffer great pain, and the surrounding tissues of the cheek become, in some degree, swollen and brawny. It may be doubted whether the disease has any connexion with a specific poison; at any rate, it certainly does not observe any laws of periodicity, but may be of very various lengths of duration and degrees of severity. In what does it differ from cancrum oris? Probably in degree only. Cancrum oris is, in all likelihood, but an intense form of it, in which the symptoms run their course rapidly. Between the two, all gradations may be observed, from an affection which kills in the course of a few days, destroying the whole cheek by sloughing phagedæna, and one of which the sole sign is a small, painful, unhealthy ulcer on the mucous membrane, which advances so slowly that it shows but little progress even in the course of weeks. Cancrum oris is a very rare disease; and probably not one-twentieth of the cases of phagedænic stomatitis ever proceed to such a stage as to merit that designation. Of true cancrum oris I have, during the past year, had but one case under care, and it came under treatment when the little patient was all but meri-

bund; and as death took place before a second dose of the medicine could be given, I may fairly exclude it from consideration in the present report. The following five cases are examples of phagedænic ulceration, several of which I am disposed to think would have run on to much greater severity had they not been arrested by treatment. I would venture to ask especial attention to their particulars, as they are those in which the power of the chlorate seems most conclusively shown.

Case 9.—S. Chatfield, aged 7, an unhealthy-looking girl, was kindly transferred to my care by my colleague Dr. Ramskill, on December 9, 1854. Dr. Ramskill knew my crotchets in respect to this remedy, and sent her as an instance in which the chlorate of potash had failed to effect any permanent benefit. She had been for five weeks under his care, and had taken for the first month of that time 7-grain doses of the salt three times daily in bark. The disease, which was sloughy ulceration of the cheek and tongue, had at one time been nearly healed and then again relapsed. It had not got worse under observation, and was now much in the state it first presented. A sulphate of copper lotion had been freely applied. The girl looked ill, being of a yellow, dusky complexion, and of a heavy, oppressed aspect. In her left cheek was a large irregular ulcer, with a surface covered with a grey glutinous secretion, and its edges livid. The cheek was much swollen, and was firm and somewhat brawny. On the opposed surface of the tongue was an ulcer of similar character, about an inch in length. The gums were spongy, and the teeth rather loose. One tooth, the first molar, was so loose that, being decayed also, I thought it best to remove it. The tooth did not present any sharp points which could have been supposed likely to irritate materially. The breath was very fetid. Twenty grains of the chlorate were ordered in bark three times daily. No other remedy. No alteration in diet. Four days afterwards the breath was free from fetor; the ulcers were clean, and presented healing edges. The child looked much better. Ten days after the ulcers were all but healed, when suddenly a relapse took place, and they again opened. The breath again became somewhat fetid. I suspected an omission of the medicine, but could not obtain any confession that such had been the case. The chlorate was now increased up to half a drachm. This dose was borne without any inconvenience, and having been continued for ten days more, the mouth became quite and permanently sound.

Case 10.—M. A. Barnett, aged 7, a fair-complexioned child, not unhealthy-looking, living near Victoria-park, and accustomed to much out-door recreation, applied as an out-patient on April 18. In the lining of her left cheek was a large ragged ulcer, covered with pultaceous secretion, and on the opposed gum was another about a third of the size, but similar in character. There was no material thickening of the cheek. Her complexion was clear, and not faded, and, excepting the pain of the sore, the only symptom of ill-health from which I could

ascertain that she had suffered was an almost constant chilliness. Her parents were not of the poorest class, and, excepting that she had had but little meat, her diet appeared to have been good. The disease had existed a month, and was getting worse, in spite of treatment. The remedies which had been used were aperients, and the local application of borax and honey. Ordered: 15 grains of chlorate of potash in water coloured with tincture of cardamoms. To live exactly as usual. A week's supply of the medicine was given, and the patient did not attend again. On August 11, however, on returning from a few weeks' absence from town, I found this girl again among my patients. She had been admitted on July 18, that is three months after her first attendance, with a relapse of the original disease. Her mother told me that on the former occasion, after taking the week's supply of medicine (that is about ʒvj. of the chlorate), the sore all but healed, and for some weeks she was so nearly well that it was not thought worth while to bring her to the hospital. After remaining thus for three weeks, however, it relapsed, and slowly spread. When re-admitted on July 18, a friend of mine, who was kindly on duty for me, prescribed the chlorate in doses of three grains and a-half; and this she had now taken for three weeks, the disease remaining nearly *in statu quo*. The ulcer was still sloughing, the teeth were loose, the gums easily bled, and the breath fetid. The mother begged me to order the child the medicine I had given on the former occasion, and which, to use her own expression, "had cured her directly." I did so, thus increasing the dose from 3 to 15 grains. In three days, the sore cleaned, and the breath became sweet; and, in spite of the omission of the medicine on one occasion for three successive days, the patient not attending, I was at the end of a fortnight able to make the following note:—"Excepting a few small points along the margin of the ulcer, it is perfectly healed. The gums do not bleed, but are sound, healthy-looking, and not unduly red. She can eat anything, and is quite well in every respect."

Case 11.—Miriam Wolf, aged 5, a pale, delicate child, was admitted on September 8. There were no sores on the cheeks, but the gums were swollen, ulcerated, and bled when touched. The breath smelt horribly. She could not eat, and was stated to have slept badly. The disease had existed for eight days, and followed measles. Borax and honey had been used, but the condition of things was rapidly getting worse. Seven grains of chlorate of potash three times daily and a single aperient were ordered. One week afterwards, the gums were sound, the breath sweet, and she could sleep and eat well. Fearing a relapse, I recommended a continuance of the medicine, but the mother did not think it worth while to attend again. On account of another disease, I saw her a month afterwards, and then learnt that there had been no return of the stomatitis.

Case 12.—Rachel Woolf, aged 2, a pale, delicate Jew child, was admitted on June 9 with a phagedænic ulcer in the right cheek. The whole cheek was much swollen, and presented externally a tense,

smooth hardening. The breath was fetid, and the gums liable to bleed. The disease had followed measles three months ago, and was advancing. The child suffered much pain, and had lost flesh greatly. Her appetite was pretty good, but she slept very badly. Ten-grain doses of the chlorate in water three times daily were ordered. No other treatment. A week later the smell had almost disappeared, the cheek was fast healing, she could sleep well, and seemed free from pain. Improvement had been apparent two days after commencing the medicine, and had progressed steadily. The medicine was repeated, and the child did not attend again, being, I have no doubt, cured.

Case 13.—Michael Lipman, aged 5, a short and florid boy, who had been well fed and cared for, came under care on October 13 of the past year. Excepting two molars on the left side, he had never cut any teeth in his upper jaw; the teeth in the lower jaw were very small and imperfectly formed ones. The disease, however, for which he came was a deep phagedænic ulcer in the gum of the upper jaw, about an inch and a-half in length, and involving the space which the incisor teeth should have occupied. The mouth was full of saliva, the breath was fetid, and the sore liable to bleed. The ulcer was occupied by grey gelatinous secretion, and looked exactly as if the incisor teeth had all been extracted, and the wound had sloughed. The history was, that the disease had commenced five months ago, but had much increased in severity during the last week. The lower lip was swollen, and hung down, but there were no excoriations or aphthæ on it. The chlorate in 15-grain doses in water was ordered. On Oct. 20, one week after, the sore was nearly clean, and for several days there had been no bleeding. On October 27 the gums were quite sound, and the sore healed, excepting in the centre, where the exposed fangs of the central incisor teeth could now be distinguished. During the next week he took no medicine, and at the end of it the gums again showed a tendency to bleed, the sore, however, not relapsing. The remedy was repeated, and the gums again ceased to bleed.

These five cases, with one exception, in which the disease was mild, and the patient attended but once, comprise all the examples of this affection which have come under my care during the period included in this report. They all of them show the disease, which in several was in a very threatening stage, yielding to the remedy with a rapidity and in a manner which it is, I think, not possible to misinterpret. In two we have it barely kept in abeyance by small doses, and at once cured on the substitution of larger ones. It would appear, indeed, that in whatever stage the disease presents itself, from three days to a week's use of full doses is all that is requisite for its arrest. They also show the necessity for continuing the remedy for a little time after the cure of the disease, if relapse would be prevented. I will now pass to some cases in which it was used against

Mercurial Ptyalism.—Case 14.—Eleanor Cole, aged 19, a prostitute, came under care on account of primary syphilis. A pill contain-

ing gr. iij. of blue pill and a quarter of opium was ordered twice daily. At the end of a week she presented herself, most profusely salivated. Only about two pills had been taken, as she had been directed to suspend them as soon as the gums were touched. The lips, gums, and cheeks were much swollen; large, ulcerated, sloughy surfaces on the inside of the cheeks; the smell was very fetid; and the discharge of saliva profuse. She could neither eat nor sleep. The original sore had lost its hardness, and was nearly well. Ordered fifteen grains of chlorate three times daily, in water. Three days afterwards the mouth was nearly well, and she then stated that there had been perceptible improvement on the second day. At the end of a week she could eat crusts, and the gums were firm and sound.

Case 15.—Anne Mallis, aged 28, a prostitute, applied for treatment on account of a large, circumscribed patch of syphilitic impetigo on the buttock, from which she had suffered for nine months. Ordered five grains of blue pill every night, and three grains of iodide of potassium three times daily. These remedies she persevered with for a week, although her mouth had become sore on the third day. Ten days after her first visit she came to me for a second time, being then most profusely salivated. The eruption had disappeared. I ordered the chlorate of potass in scruple doses, and in a few days her mouth was well.

Case 16.—Cornelius Fitzwilliam, a pale, cachectic man, was ordered to take five grains of blue pill every night, on account of primary syphilis. He continued the remedy for a fortnight, at the end of which time rather profuse salivation set in. It had been increasing for five days before he attended, and for two he had omitted the pills. The gums were much swollen, the teeth coated, and the mouth running with saliva. Inside the cheeks were superficial ulcers. Ordered ʒj. of chlorate three times daily. Three days afterwards the sores in the cheeks were healed and the gums were very greatly improved; the salivation was, however, still slightly present.

At the time these cases were under treatment I did not know but that they were the first in which this remedy had been tried in salivation; but more recently I have been glad to find much corroborative testimony in a paper published in the 'Bulletin General de Therapeutique' for May of the present year. It would appear, that M. Herpin, of Geneva, MM. Blache and Demarquay of Paris, have all tried it, each in a series of cases, and with the most favourable results. To M. Herpin belongs the merit of having been the first to use it. Doses of about ten grains, three times daily, seem to have been the favourite ones; but in one case it was pushed as far as a drachm. Of Demarquay's cases, six in number, the details of which are given, four days was the average time occupied in effecting complete cure. To those who have confidence in the powers of the chlorate against the other forms of stomatitis, the employment of it against that caused by mercury is but a very natural step, and there is nothing surprising in the circumstance that it should have suggested itself to several independent observers

about the same time. That they should have all agreed in their results adds much of certainty to their conclusion.

[There are many cases here which could not be classed under any general head. We shall, therefore, content ourselves with merely pointing out the prominent features of each.]

Abscesses. Eruptions. Ulcers. &c.—Case 17.—An infant of three months, with the aspect and odour of congenital syphilis, but no specific symptoms. Ill for three weeks. with large abscesses in thighs and neck, eczema about labia, and ophthalmia tarsi. Three grains three times daily; abscess in neck opened; no other treatment. A week after:—very much better: eyelids well. The abscess healed kindly, and several large indurations, which threatened suppuration, are absorbing. At the end of a fortnight, undoubted symptoms of syphilis showed themselves, and the chlorate was laid aside for mercurials. It must be noted that, although the chlorate did not appear to modify the specific disease, yet under its use the tendency to the formation of abscesses subsided.

Case 18.—An infant, aged 9 months; spoon-fed, but healthy-looking. Whole mouth inflamed, but without actual ulceration. Feverish. Gr. ij. ter die. In four days the mouth was nearly well; in ten it was quite so.

Case 19.—Emma Hutters, aged 20 months; pale and delicate. Admitted on account of a tense, brawny, ill-defined induration in the right buttock, quite as large as a fist. She had suffered much pain in it, and the inflammation had been daily increasing for four days. I made no doubt but that pus existed in its centre, but, from the great thickness of tissue, deferred an incision. Ordered pot. chl. gr. iv., ter die. This was continued for a week, during which the infant improved in health; and the swelling, instead of coming forward, gradually diminished. Two weeks after, the swelling had quite disappeared, but there could be felt under the skin a mass of induration, resembling to the touch a large subcutaneous cicatrix.

Case 20.—A woman, aged 50, admitted on account of a very large phagedænic ulcer of the leg, extending down its front aspect just over the tibia. She had never had sores on the leg until the present, which commenced from a graze three weeks ago. Its edge was phagedænic, and extending rapidly. Ordered chlorate, gr. x. ter die. An alterative pill every other night, and the ointment of the ammonio-chloride of mercury. The sore progressed favourably from the day after the commencement of the treatment, and in less than six weeks was quite healed. The woman had been allowed to pursue her ordinary avocations the whole time. On account of the other measures of treatment, no trustworthy inference as to the effect of the chlorate can be drawn.

Case 21.—A pale, delicate lad, aged 16, admitted with acute inflam-

mation of the pharynx; the tonsils presented symmetrical ulcers. The throat was stated to have been very sore for two days. He had never had it before, and there was no reason for suspecting syphilis. The chlorate in ten-grain doses, and an alum gargle. In three days he presented himself quite well; the throat, he said, lost its soreness the day after commencing the treatment.

Case 22.—A stout, pale boy, aged 16 months. Eczema impetiginoides on nose and chin, with enlarged lymphatics in neck. Disease of two weeks' duration. Some feverishness. Pot. chl. gr. v. ter die; no other treatment. Three days later is feverish, and has a cough. Continue the mixture, and apply tinct. iodid. co. to the chest. He ultimately got quite well, without any local application to the disease.

Case 23.—A Jew, aged 50, for two months the subject of repeated crops of boils. Many small boils mixed with impetigo, and scars of former ones. I touched the larger boils with acid nitrate of mercury, and ordered gr. x. of the chlorate. A week afterwards most of the boils had disappeared, and all were declining. He recovered well. without any addition to the treatment.

Case 24.—A fairly healthy man, aged 35, admitted on account of a rather extensive eruption of ecthyma, mixed with lichen, over the thighs, legs, and shoulders. Ordered ten grains of chlorate thrice daily; no other treatment. The eruption, which had existed for three months before, and had been increasing in severity during the fortnight previous to admission, was very perceptibly diminishing at the end of the first week; in three weeks it was quite well.

Case 25.—A healthy boy, aged six. Sores on the lips of three weeks' duration, and impetigo about the arms; no sores whatever in the mouth, and no fetor of breath. Ordered gr. vi. ter die; ung. hyd. am. chl. One week, lip no better. Is feverish and restless, but eats well, and has no degree of stomatitis. Increase the dose of chlorate to ten grains; a calomel purge. End of third week:—the lip is well. No evidence of benefit from the chlorate.

Case 26.—A boy, aged nine; had been liable to eruptions ever since the age of seven, when they followed small-pox. His scrotum and abdomen were covered with impetigo sparsa, which was stated to have been in its present state for six months. His tonsils were enlarged, and a few sores on the lining of the lips seemed to indicate a tendency to stomatitis. Ordered ung. hydr. am. chl., and six grains of chlorate three times a-day. In three weeks he was well in every respect, excepting a few spots on the chest.

Case 27.—A fair-complexioned, rather delicate-looking boy, aged 14 months, came under treatment for an acute outbreak of pemphigus, attended with much fever. The eruption chiefly affected the neck; and some of the surfaces, exposed by the bursting of the bullæ, had formed superficial ulcers. His cheeks were swollen, and the mouth

aphthous. He was feverish, had no appetite, and looked very ill. The illness had lasted a week, and the eruption had in the first instance come out in the thighs, arms, &c. Ordered gr. vij. ter die; ung. zinci to the ulcers. This treatment was continued without modification for a fortnight, when the note states—All the places healed very quickly, and the skin is now quite sound, He looks much better, and although at times fretful, is generally lively and cheerful. Tongue furred; is cutting teeth. To omit all medicine, and apply again should any relapse occur. Did not again attend.

Case 28.—An infant of Irish parentage, aged 14 months; miserably pale and ill-looking. Three weeks ago, he had scarlet fever, after which large sloughing abscesses in the neck followed. The muscles of the trachea were exposed, and there was a large ulcer, entirely destitute of granulations, presenting a clear glossy surface and having undermined edges. His mother in answer to my inquiries, said she thought him, if anything, a little better than he had been a few days ago. He was still, however, in a condition of great danger. I ordered the chlorate, in doses of 15 grains, which were for one so young very large. No other treatment. He was at the breast. Three days after the ulcers were granulating healthily, and he was very much better in every respect. The skin over a large collection of matter in the left neck being on the point of giving way, I opened the abscess. To continue the medicines. His mother did not bring him again for three weeks, and I then learnt in the interval he had had the measles, and had almost died. The condition of things in the neck was now worse than ever; the left sterno-cleido mastoid was exposed for a considerable length, and the whole front of the neck was one ulcer, burrowing deeply beneath adjacent structures. No sloughing was now in progress, but the surface was pale and glossy with profuse suppuration, but little tendency to granulate. To take the same mixture as before. A week later the ulcer had again assumed a most healthy condition, and was rapidly healing. He appeared in fair health. The dose of the chlorate was reduced one-half. A fortnight after the commencement of the second treatment, the ulceration had healed to a comparatively small size. He was still very pale, and had some spots of porrigo about the face. A small abscess behind one ear required opening. Continue the mixture, and give also a tea-spoonful of cod-liver oil twice a-day. Recovered perfectly.

Case 29.—A boy, aged 3, in fair health, liable to eruptions since vaccination, applied on account of a sore mouth, of one month's duration. It appeared from the history to have been originally follicular stomatitis, but all that now remained was deep fissures, with whitish borders, extending in the lining membrane of the cheek, from the right angle of the mouth. The cheek was somewhat swollen. Fifteen grains of the chlorate three times daily were ordered. Ten days after, his mother attended without bringing him, and told me that the sore

had improved from the very first day of taking the medicine, and was now quite healed. No other treatment had been pursued.

Case 30.—A Jewess, aged 23, came under treatment for sore throat, and a small ulcer on the side of the tongue, both of two week's duration. The tonsils, pharynx, and mouth generally were congested. The voice was hoarse. Ten grains of chlorate three times daily. The sore on the tongue was healed in four days, and the throat was much improved. She continued the treatment for ten days, but did not quite get rid of her hoarseness, although well in every other respect.

Case 31.—A woman, aged 31, was admitted under the care of my colleague, Dr. Ramskill, on account of hemorrhagic purpura. The illness had lasted seven days, and was increasing in severity. As usual no dietetic cause could be assigned for its outbreak. There had been profuse bleeding from the vagina, the skin was covered with spots and bruise-like patches, and the gums were swollen, spongy, and bleeding. Dr. Ramskill ordered chlorate of potash in fifteen grain doses in bark, three times daily. I saw the patient at her own house a week after this treatment had been commenced; she was now confined to bed and extremely feeble; the bleeding from the vagina continued; she was pale to a degree; the spots still existed, and every slight pressure caused the appearance of a bruise. In one respect, most marked improvement had however resulted. The gums had become firm, adhered to the teeth, and for several days had ceased to bleed. Excepting that they were very pale, they were in a quite healthy condition. I am not able to state the final result of this case.

Cases 32 and 33.—In these two cases, after capital operations, I employed the chlorate of potash in half drachm doses, because on the fourth day the wounds had not assumed a healthy condition, were inflamed, and covered with tawny lymph. In the one, the elbow-joint had been excised, and in the other the breast removed. In both the chlorate was continued for about ten days, and in both the patients did remarkably well, whilst taking it the wounds becoming covered with florid granulations. As in each case, however, the remedy was ordered at the exact juncture at which wounds after operations very commonly assume a healthy appearance, I would be far from wishing to infer that it caused the benefit which followed its use. One thing, however, is certain, that even in such full doses it in no way prevented the favourable progress of the patients.

These 33 cases, of which, at greater or less length, I have now brought the particulars before the Profession, comprise somewhat more than the half of the whole number in which, during the past year, I have made trial of the chlorate. The remaining 25 I am unable to adduce as evidence, because in about half of them, the patients did not attend a second time, and in the others the treatment pursued was so complicated that no safe inference could be made respecting the influence of any of its elements. Of those patients who did not attend again,

I think it very probable, that most found themselves well at the end of the week's medicine; the list I am sorry to say, includes several cases of very great interest, and in which I had ordered the remedy in unusually large doses. Leaving here, then, the citation of cases, I will attempt a brief summary of the conclusions therefrom, but before doing so it will be convenient to say a few words on the

Administration and Dose of the Remedy.—The chlorate is fortunately a most easy medicine to administer. In solution in water, either plain or sweetened, it has but little taste, and is readily taken even by children. About 25 grains are soluble in an ounce of water, so that the very full dose of two scruples and a-half may be given in four tablespoonfuls. Its solubility I have ascertained by trial to be considerably greater than stated in Pereira and other books. Then comes the question, is it desirable to give it alone or in combination? Although in the cases cited I have administered it without adjuvant, in order the better to test its powers, I am far from wishing to advocate such a practice. It may easily be supposed that in not a few of the cases requiring its use, the employment of direct tonics may also be indicated. Still I do not recollect to have ever had occasion to regret that I had not given tonics together with it, and, in general, no better result could possibly have been hoped for than it alone produced. Those, therefore, who incline to prefer simple prescriptions are fully authorised in relying upon its unaided powers in cases really suitable for its use. It is difficult to discover, either from personal observations or from the reports of others, any symptoms which might be taken to indicate disagreement of the remedy. Indeed, its administration in most cases causes no perceptible effect except the disappearance of the disease. It probably acts slightly as a diuretic, and in proportionate degree causes thirst. In very large doses it purges young children, as has been shown in the case of a child aged 2, now under my care for cancrum oris, to whom in the space of four hours I gave about a drachm of the salt.

As to dose it is interesting to observe, that although the earliest cases recorded were treated successfully, and without casuality, by scruple doses to children, yet a strange dread appears to have since arisen, and it is now common to hear a grain to a year spoken of as an efficient and average quantity. Mr. Sayle, in the first case of phagedæna of the mouth on record, as treated by it, states that he gave scruple doses to a child six years old; but Dr. West, in his lectures on "Diseases of Children," recommends only a grain to a year. Several of the cases just cited show in a remarkable manner the failure of small doses, and the subsequent efficiency of larger ones. Perhaps, for infants of one year, about five grains might be a fair ordinary dose, and for those older it should be proportionately increased—a scruple or half a drachm being the quantity for an adult. From smaller doses than these I am convinced that disappointment will frequently ensue, and discredit be thrown upon the remedy. If

the disease be an acute one, it will be desirable to push its employment, and this will be better done by giving the same dose more frequently, than by increasing it. If unduly increased there is danger, as has been seen, of the salt being carried off by purgation and its influence lost. Here I may remark, that it seems but justice to a remedy, the virtues and potency of which are so indubitable, that it should always be fully pushed before being abandoned in cases in which it at first appears to fail. More especially does this obtain in cases of gangrene about the mouth, from whatever cause. In all such, I would, before giving it up, increase its dose and the frequency of its administration until obvious symptoms of disagreement presented themselves. Some cases on record have required enormous doses, and have yet yielded kindly when so attacked. It is certainly unfair to cite cases of its failure, if in adults it has not been pushed to an ounce a day, and in infants to at least a drachm. I have no hesitation, whatever, in attributing the doubt with which its merits have been regarded by some of late to the very inefficient doses in which they have prescribed it. M. Gerlin mentions, that once while in perfect health, he took, for the sake of experiment, a single dose of no less than two drachms, and that excepting a slight nausea next morning no inconvenience followed.

Conclusions.—The two following *conclusions* appear to be warranted by the facts which have been adduced :—

1. That chlorate of potash possesses a peculiar influence over all inflammatory affections of the mouth. (The syphilitic, perhaps, excepted.)

2. That chlorate of potash possesses a peculiar influence over inflammations attended with phagedæna or sloughing, on whatever part of the body situated.

The second conclusion I would put with much less of positiveness than the first. It is when two conditions are met with in combination that its powers are best shown, that is, when the inflammation is of the ulcerative type, and has the mouth for its seat. As demonstrative of its especial influence on the mouth, we have seen it cure simple inflammatory congestion, common ulcerations, and phagedæna. The stomatitis of ptyalism, and the hemorrhagic sponginess of the gums met with in purpura, both yield to its influence. Disorders, dissimilar as to cause, as to nature, as to stage, degree of severity, and tissue involved, and common only in being situate in the mouth, appear to be almost equally amenable to its control. Without attempting any explanation of it, such certainly appears to be the clinical fact. The facts relating to its power over ulceration and sloughing in other parts of the body, are less positive, but still of considerable weight, and some of them would seem to indicate that suppurative inflammations might also be included in the category. I will not venture to make any enumeration of the very various diseases in which, should further experience confirm this belief, the use

of the chlorate will be required. We have, in mercury, a remedy which all observation demonstrates to possess specific powers in arresting adhesive inflammation, and removing its consequent effusion of organized lymph. There are circumstances which might suggest to the sanguine mind, that it is not improbable but that the chlorateof potash will sometime attain a like reputation against all inflammation attended by the effusion of pus, or the destruction of tissue.—*Medical Times and Gazette, August* 16, *and* 23, 1856, *pp.* 172, 191.

26.—REMARKS ON THE ACTION AND USES OF THE CHLORATE OF POTASH.

By Dr. Stanhope T. Speer, Cheltenham.

[The following is a summary of the conclusions lately arrived at by M. Isambert respecting this salt.]

Upon the Nervous System chlorate of potash acts as a sedative. This action is not perceptible in health; it would appear to show itself only in certain pathological conditions.

Upon the Circulation it also acts as a sedative. This action is manifest only in disease; in health it is imperceptible.

Upon the Respiration.—Its action here is negative, or at least is confined to a trifling irritation of the bronchi and larynx, which may prove serviceable in certain diseases.

Upon the Digestive Organs it acts, in general, as a stimulant. It increases the secretion of saliva in a marked degree, and appears to act as a useful substitute in mercurial salivation; upon the biliary secretion it acts as a gentle stimulant, capable of determining a slight bilious flux, although not freely eliminated by this organ. Possibly, moreover, it may act as a sedative upon the nervous or inflammatory element, in cases of jaundice.

Upon the Urinary Secretion it acts as a moderate stimulant in large doses; in small doses, its action is but slightly marked.

Upon the Mucous Secretions it acts as a stimulant and as a beneficial alterative. It is eliminated by the cutaneous surfaces, without increasing their natural secretion. It acts more slowly in skin diseases than in those of mucous membranes; it appears, moreover, to favour interstitial absorption, according to Chaussier and Bertrand. As regards what chiefly merits attention, viz., the action of this salt upon the buccal, nasal, pharyngeal and laryngeal membranes, we hesitate to pronounce authoritatively respecting its real *modus operandi*, this being, as yet, a mere matter of hypothesis. We believe it, however, to possess the power of modifying the vitality of these membranes, through its elimination by the mucous secretion itself; its free elimination, moreover, by the saliva, explains its specific action upon the mouth. On calling to mind the cures performed by M. Lasegue, with this salt, when used as a collutory or gargle, we might be tempted to regard its

action upon the mouth as merely topical. This, however, we do not believe to be the case; the trifling amount of chlorate of potash found in the saliva, especially when given in small doses, cannot be compared to the saturated solutions employed by M. Lasegue. A proof that the chlorate of potash when given internally is not exclusively a topical agent, returning as it were, by the salivary secretion, is its difference of action upon the mucous membrane of the cheeks and lips, and upon that of the gums, endowed with a lower degree of vitality than the lining membrane of the other parts of the mouth; allowing, however, that its action be a topical one, it will always be advantageous to administer it internally: the taste of this salt being almost imperceptible in a sweetened solution.

An experiment was made lately by M. Blache with the view of ascertaining the topical action of the chlorate of potash. A child, 8 years of age, affected with membranous stomatitis of one month's standing, was treated by the local application (6 times daily) of this salt, in a strong solution (5 per cent). After three days, the false membranes began to detach themselves, and at the end of a week, they had almost entirely disappeared; the cure, however, proceeded more slowly than when the salt was administered internally. The mucous membrane remained of a dark red colour after the disappearance of the exudation, and the extent of diseased surface was, for some time, but little diminished; the cure not being completed before the fifteenth day. Chlorate of potash, moreover, was found in the urine of this child, showing that it had either been absorbed by the mucous membrane or else swallowed.

Has the chlorate of potash, we may ask, a specific action upon the constitutional origin of diphtheritic exudations? Facts do not permit of our answering this question in the affirmative.

It has no specific action against certain diseases, such as syphilis, for which it has been long employed.

As a topical application, it ranks with certain other mild irritants, such as borate of soda, sulphate of zinc, &c. It favours the cicatrization of ulcers.

As an internal remedy, it may be classed with the alteratives. Its analogous salts being the hydriodate and nitrate of potash, rather than the alkaline carbonates, from which it differs in its action upon the urine.

Method of administration.—The chlorate of potash may be given in doses of from half a drachm to 2 drachms daily.

No inconvenience results from increasing the dose of this salt, some of its physiological effects being only obtained when given in somewhat large quantities; viz., diuresis, profuse salivation, its action on the larynx and bronchi. The only difficulty connected with its administration, consists in its slight solubility. The ordinary solution of gum-arabic readily dissolves from 75 to 90 grains at a temperature of 60 degrees; but it is not sufficient, merely to add crystals of the chlorate

to the vehicle about to be employed, and in which they would dissolve with difficulty; it is preferable, as recommended by MM. Bergeron & Vial, to dissolve the salt completely in water, before adding syrups, &c. In drachm-doses, this potion is by no means disagreeable, and children take it readily.

Should it be desirable to administer the remedy in large doses, it must be dissolved in a large quantity of fluid; in this state it is more easily borne by the stomach, than when given in concentrated solutions. Chaussier advised the remedy to be given at meal-times, an important precept, more especially when large doses are administered. Odier gave it in broth.

It may likewise be given in powder, mixed with sugar, as recommended by Herber and Schoeffer.

Lastly, it may be prescribed as a topical application, in the form of a lotion containing 5 parts of the salt to 100 of water at a temperature of 60 degrees. If a more concentrated solution be desirable, hot water must be employed, as was done by M. Lasegue; at a temperature of from 86 degrees to 104 degrees, 15 per cent. of this salt may be dissolved.

Its application in the form of powder, combined with starch or oxide of bismuth, would appear to produce pain.—*Med. Times and Gazette, Sept.* 20, 1856, *p.* 288.

27.—SIMPLE CHRONIC ULCER OF THE STOMACH IN ITS MEDICO-LEGAL RELATIONS.

By Dr. Lees, Physician to the Meath Hospital.

Having discussed the positive and differential diagnosis of simple ulcer of the stomach, as well as the symptoms of perforation, I will briefly allude to this subject in its medico-legal relations, as suspicion of poison has occasionally arisen when a person, in apparent health, has died after a few hours' illness, from perforation of the stomach. Mr. Alfred Taylor, in an important paper on this subject, states that "perforation from natural causes has, in more than one instance, been mistaken for perforation from poisoning," and he enumerates the following general characters, in which they resemble each other:— 1. "The person attacked is commonly in apparent good health." 2. "The symptoms are, chiefly, violent pains in the abdomen, with or without vomiting." 3. "These symptoms are often suddenly developed soon after a meal." 4. "The case proves rapidly fatal, death generally taking place in from eighteen to thirty-six hours, which is about the period within which arsenic destroys life." He selected arsenic as the example because it is so common a poison, and causes symptoms somewhat similar to those caused by disease; besides we could not well mistake perforation from disease for that caused by corrosive poisons. To form a diagnosis for medico-legal purposes, Mr. Taylor advises that we should take into account the following circumstances:—

1. "Perforation of the stomach is comparatively frequent, as a result of disease, and is apt to attack a particular class of persons, namely, young females. Perforation is so rare an effect of arsenic, that out of a vast number of accurate reports of death by this poison, there are not, so far as I am aware, more than three cases in which this morbid change has been observed; and only one of these occurred in Britain. This fell under the notice of that accurate observer, Dr. Christison."

2. "In perforation from disease, the symptoms may not occur until three or four hours after any substance has been swallowed. In arsenical poisoning, the symptoms commonly occur in about half an hour after the substance containing the poison has been taken."

3. "In perforation from disease, the pain in the abdomen occurs uddenly, and is of the most intense character. It is sometimes felt n the lower part; and at others, over the whole of that cavity. In arsenical poisoning, the pain comes on gradually, slowly increases in severity, is commonly described as of a burning kind, and is chiefly confined to the region of the stomach."

4. "In perforation from disease, vomiting, if it exists, is commonly slight; and it is chiefly confined to what is swallowed. There is no purging: the bowels are generally constipated. In arsenical poisoning, the vomiting is usually severe, and diarrhœa is seldom wanting."

5. "We must attach some value to the shortness of the period within which diseased perforations destroy life, from the time of the first appearance of the symptoms, as the stomach has not been found perforated in any instance in which arsenic has destroyed life within twenty-four hours."

6. "In perforation, peritonitis is generally the sole cause of death. In arsenical poisoning, the fatal result takes place under the peculiar symptoms produced by the poison."

7. "In diseased perforation, the mucous membrane of the stomach and small intestines is not commonly inflamed; but in Dr. Christison's case, the surface of the stomach was very vascular, marked in different places with dark-brown spots of various sizes, and here and there abraded. The intestines were internally very red."

8. "*Situation.*—In perforation from disease, the aperture is commonly placed in or near the lesser curvature; but arsenic may perforate the parietes in any part of the stomach. In Dr. Christison's case, the perforation was in the anterior wall; but as a general rule, perforations from poisons are found to occur in the basis or fundus of he stomach."

9. "*Size.*—No criterion exists on this ground. In the above case the aperture was about the size of a pea—the size which is often found in perforation from disease. In regard to other characters, we

may observe, that in perforation from disease, the border is sometimes smooth, presenting no mark of erosion; it may be thickened; and the thickening extends occasionally, for some distance around, into the parietes of the stomach, which are indurated. In the case of perforation by poison, already alluded to, the aperture had a dark, ragged margin."

10. "In perforation from disease, no poison will be discovered in the stomach or intestines, and in general, the absence of poison from a perforated stomach ought to be taken as a fair presumption against the origin of the perforation from poison."

"Lastly, let us suppose that the fatal symptoms first showed themselves within half an hour after a meal—a case in which there would be *cæteris paribus*, the strongest ground to suspect irritant poisoning—we sometimes have it in our power to rebut this suspicion, by a very simple investigation. If others partook of this same meal in company with the deceased, without manifesting any symptoms of disturbance, it would go to disprove the fact of poisoning." Mr. Taylor concludes by stating, that "perforation of the stomach from disease cannot therefore be said to present any difficulty to the medical jurist, unless peritonitis follow. It is the rapid death, under symptoms of violent irritation, from a state of health, that excites suspicion."

There are two important facts worthy of notice, in a medico-lega point of view; first, that ulceration of the stomach may advance to perforation without a single symptom to indicate its presence. Dr. Abercrombie has recorded the case of a "strong and healthy-looking servant girl, aged 21, who was suddenly seized with excruciating pain in the abdomen, sickness, and vomiting, and died in eighteen hours from the attack. In the middle of the smaller curvature of the stomach there was a recent opening, the inner surface of which presented a deep excavation, with rounded and smooth edges;" "*this patient was never known to complain of her stomach, or to show the smallest deviation from robust health.*" Secondly, it has been ascertained that a person has walked for a quarter of a mile after being seized with the first alarming symptoms.

[The following communication on this subject, received by Dr. Lees from Dr. Geoghegan, will be read with interest:]

In reply to your inquiries, I beg to observe that the simple or chronic ulcer of the stomach, when followed by perforation, does not, according to my experience, present any very substantial difficulties in medico-legal practice. It is true that the symptoms have a certain general resemblance to those of irritant poisoning, which, with the fact that they not unusually commence shortly after a meal, has often led to the suspicion of violent death. The real nature of the case, however, seems in general easily recognizable, even during life.

Thus, the early period of the illness at which pain sets in with intensity (the obvious physical and other characters of the vomited matters meanwhile forbidding the idea of *corrosive* poisoning), together with the absence of any ulterior manifestations than those of shock and peritonitis, are generally distinctive. When to this are added the general conditions and history of the patient, the nature of the attack becomes sufficiently plain. Occasionally the *length of interval* between the last ingestion of food, drink, &c., and the access of formidable symptoms is, in itself, nearly decisive. Accordingly, I found this latter criterion available in the instance of a gentleman who died of perforating ulcer of the duodenum. Should the case become the subject of medico-legal inquiry, the extreme definition of the ordinary anatomical characters, and the usual site of the ulcer, will, in general, clear up all doubt. The peculiar aspect of the margin, as if a piece had been "punched" out of the coats, the absence of surrounding red areola, and commonly of induration, the want of signs of irritation in the mucous coat at large, are nearly conclusive to the practised eye. It deserves notice, however, that, in a few cases, the condition of the adjacent lining membrane may, at first glance, excite a suspicion of corrosive poisoning, presenting, as it does, patches of dark coloration. This, however, will be found, on closer inspection, to be merely a tract of finer vascular arborescence, acted on by the gastric acids. The comparative *rarity of ulcerative* perforation of the stomach as the result of poisoning, however important as an abstract proposition, can scarcely be considered a safe element of diagnosis, as regards the investigation of individual cases. It may be inferred from the above, that a chemical inquiry will seldom be requisite with a view of determining the origin of such ulcerations; when called for, however, the necessity of occasionally extending it from the stomach and its contents to other quarters (as the liver, &c.) should not be lost sight of. In some instances, especially where the illness has been of unusual duration, the poison, if any, may, by the operation of obvious causes, have been removed from the former, although discoverable elsewhere. It may be not improper, further, to observe, as related to the present subject, that although *ulcerative* perforations (for the reasons assigned) do not usually cause material embarrassment, the diagnosis of those arising from digestive *solution* of a portion of the stomachic walls is not always free from difficulty. Thus, in some few instances, a previous uniformly vascular condition of the mucous membrane gives rise, under the *post mortem* influence of the digestive fluids, to appearances which strongly simulate those of poisoning by sulphuric or oxalic acid. A notable example of this kind presented itself in the judicial inspection of the body of a newborn infant, in which I was some time since engaged. As the history was wanting, a chemical inquiry became necessary, and effectually dispelled the presumption created by the character of the appearances. —*Dublin Hospital Gazette, August* 15, 1856, *p* 214.

28.—TREATMENT OF ULCER OF THE STOMACH.

By Dr. William Brinton, Physician to the Royal Free Hospital.

[Ulcer of the stomach is by no means rare; it may be observed in about 2½ per cent. of the bodies of persons dying from all causes. It is twice as frequent in the female as in the male. It is most common in persons of middle and advancing life, and is most frequently situated on the posterior surface, the lesser curvature, and the pyloric pouch.]

The ulceration has no precise limits of *size*, but ranges from that of a pea to an area of six or eight inches in diameter; in other words, to a superficial extent which amounts to one-eighth, one-sixth, or even more, of the total mucous surface of the organ. Its *shape*, usually circular, or oval, is sometimes elongated, or even zonular, so as to encircle the organ. Sometimes two ulcers are thus fused into one. As to *number*, a plurality of ulcers is not infrequent, occurring in 21 cases per cent. In 12⅓ per cent., there are two; in 3½ per cent., three; and four, five, or even six, have more rarely been found together.

The appearance of the tissues in and around the ulcer generally indicate a moderate amount of inflammatory reaction, the mucous membrane that constitutes the immediate margin of the ulcer being swollen above the level of the adjacent mucous surface. This thickening, which is always accompanied by induration, is produced by an exudation of lymph into the submucous areolar tissue, as well as into the matrix that surrounds and ensheathes the stomach-tubes.

The ulcer, as it penetrates all the coats of the stomach, retains the characteristic shape of a cone, the base of which is at the free or mucous surface of the organ, while its apex points towards the peritoneum. In the latter situation, the ulcer is little more than a point, which corresponds to the centre of the cone, and is the place where perforation generally occurs. This event is usually the result of the rupture or detachment of a pale-yellow slough of peritoneum. In most instances, however, perforation is either prevented, or at any rate deferred and modified, by the occurrence of adhesion, which unites the organ to some adjacent surface, and thus obliterates the peritoneal cavity at and around the ulcer. This adhesion, the effect, as well as the cause, of a protraction of the ulcerative process, occurs in about 40 per cent. of all the cases of ulcer. Its situation corresponds with that of the ulceration generally, save that it is rare on the mobile anterior surface of the stomach, or, if present here, is delicate, thready, and imperfect.

The duration of the ulcer varies from ten days to thirty-five years, the most acute or rapid cases generally ending life by perforating the anterior surface of the stomach.

The ulcer heals, by what is probably a spontaneous cure, (aided at most by the instinct or experience of the patient in respect to diet,) in about half its total number of cases. The cicatrization of a small ulcer sometimes leaves little trace; that of a large one often, by its contraction, seriously affects the shape, size, or calibre of the organ.

The ulcer perforates in about 13½ cases per cent., or 1 in 7½, a proportion which is about equal in the male and female sex.

There does not seem to be any disease connected with the ulcer often enough to justify us in deducing its causative influence. Ague, mercury, intemperance, and the puerperal state, can only be detected in special cases. While the larger numerical statements respecting coincident phthisis do not seem to show a proportion of this disease much exceeding its average in the deaths from all causes indifferently.

Lastly, these researches well illustrate the deficiency of our knowledge. They would lead us to assume that, out of every 100 gastric ulcers, 50 cicatrize; 13 perforate; 3 or 4 erode arteries, and thus give rise to fatal hemorrhage. But they thus leave about 30 unaccounted for. My own observations would indicate, that out of this 30, at least 5 die of the sheer inanition and exhaustion the ulcer involves. But even this supposition leaves a large proportion unaccounted for—a proportion concerning which we can but conjecture that the lesion shortens life by increasing that gradual failure of the nutritive functions, which is one of the most serious dangers in all maladies, as well as one of the most essential elements of death by old age.

The SYMPTOMS generally occur in the following succession:—The malady is announced by disturbances of gastric digestion; at first, uneasiness and pain in the epigastrium, then nausea and vomiting. If not cut short by perforation, these dyspeptic symptoms are next complicated by hemorrhage from the stomach; sometimes a gush, oftener a slow drain, of blood. The anæmia produced by this hemorrhage is generally associated with a cachexia which seems to be essentially independent of it, being chiefly the result of the inanition implied by frequent vomiting of the food, or by large destruction of the gastric mucous membrane, and consequent impairment of its important function. In young females, this anæmia and cachexia are often associated with amenorrhœa also.

The gradual acquisition of all these symptoms conducts the disease, in a variable time, to a climax; from whence we may next trace it towards its termination. Retaining the above liabilities to perforation, to hemorrhage, and to exhaustion, which the organic results of ulceration imply, the lesion often ends by one of these modes of dying, either singly or in combination with the others. In other cases, the symptoms subside spontaneously, in something like the inverse order of their occurrence; or a similar amendment is effected under such medical treatment as quite entitles it to be called a cure. In other instances, the symptoms continue with a moderate intensity, during a variable period of life, during which they often fluctuate so much that it is difficult to fix the exact boundary which separates remissions from intermissions, or these from complete recoveries followed by relapse. In any case, the protraction of these symptoms during many years at last mixes up the impairment of nutrition they produce with that naturally resulting from old age, and thus constitutes the malady an indirect

or conditionating cause of death—a cause, the importance of which it is difficult to exaggerate, though scarcely possible exactly to estimate.

The *pain* is rarely, if ever, absent from the whole course of the case. In its character it generally increases from a sense of weight to a dull continuous pain, which ultimately becomes gnawing and burning.

Its date of access is generally about five minutes after the ingestion of food. Its duration corresponds with the act of gastric digestion. It is therefore at once arrested by vomiting, which empties the stomach. But it may immediately follow deglutition, as in ulcers of the cardia; it may be deferred to an hour or more after eating, as in common dyspepsia; or it may continue in the intervals of the meals. Lastly, in rare cases, it may be worst with an empty stomach, and be alleviated by taking food.

In situation, the pain is usually epigastric, and interscapular or rachidian. Sometimes, to these two seats of pain a third is added, by the presence of pain of an independent character, in the hypochondriac or umbilical regions.

The epigastric pain, which appears first, is also most intense, and generally corresponds to the median line of the belly, below the point of the ensiform cartilage. It is usually limited to a circular area of which this line would form the diameter, in its uppermost two inches. Its vertical deviation seems to be sometimes, and its lateral deviation generally, connected with a corresponding situation of the ulcer, a lesion of the greater curvature, the cardiac sac, or the pyloric sac, of the stomach, being associated with an habitual site of the pain in the umbilical, and left hypochondriac regions, respectively.

The dorsal pain is still more limited in its situation, coming on later, but scarcely less constant, than the epigastric pain. It rarely lies above the ninth or below the twelfth, dorsal vertebræ; and its horizontal variation is scarcely more than one inch to either side of the spine. Hence its deviation is more characteristic of the site of the ulcer than that of the epigastric pain.

All these pains are greatly increased by very moderate pressure in the epigastrium. The exceptions to this rule are very rare, and probably depend on peculiar mechanical circumstances connected with the lesion, such as shield it from the pressure. They are all alleviated by rest and the recumbent posture. The *decubitus*, or the posture in which the patient feels least pain, affords a very valuable guide to the situation of the ulcer. When it is distinct, it will rarely mislead us.

Lastly: active movement, mental excitement, mental depression, or general fatigue, as well as the ingestion of hard, indigestible, hot, sweet, or fermenting substances, remarkably increase the pain, with rare exceptions.

Vomiting, which constitutes one of the most dangerous symptoms, generally comes on many weeks later than the pain; sometimes it remains absent throughout. It is usually the crisis of the paroxysm

of pain, coming on when the latter is most intense, and completely relieving it. It is in most instances of an easy character, from the distension of the stomach then present; and rarely ends without completely emptying the organ. The substances it expels will of course vary. Food, saliva (as in what is called "pyrosis"), blood, or bile, may all be present in varying proportions. Its greatest intensity seems to be chiefly connected with a large size and a long duration of the ulcer.

Hemorrhage, an almost unavoidable incident of the process of ulceration, is by no means equally frequent as a symptom. For, since a small quantity of blood does not exert any specific action as an emetic or purgative, it will depend entirely upon a casual coincidence of the two symptoms, hemorrhage and vomiting, whether the latter reveals the former, just as it will depend upon the amount of attention given to the stools of a patient whether we detect any blood which may have left the intestinal canal with the evacuations. The exposure of such blood to the action of the fluids of the stomach and intestine still further complicates the obvious effects of its admixture with the secretions or ingesta that may chance to be present. It acquires a dark (even black) colour, and a tarry pultaceous consistence, that testify to the alteration of its solid and the absorption of its liquid parts. Rarely, however, do these effects of digestion embarrass our decision as to the nature of the coloured substances found in the stool or vomit. And with obvious precautions against the admixture of animal food, the microscope will of course detect any quantity of blood, however small.

The larger or arterial hemorrhages generally occur after meals, during that distension of the stomach which a large quantity of food necessarily produces. Fulness and weight, soon followed (or even preceded) by faintness, rapidly merge into nausea, that ends in vomiting. The blood may be visibly arterial, if vomited at once; or partially darkened and clotted, if retained longer before expulsion. Those portions of it which pass into the intestine may also undergo more or less of the changes of colour and consistence already alluded to. Lastly, the hemorrhage may kill by a single gush, giving rise to no vomiting, and leaving the whole of the stomach and duodenum distended by a single enormous clot.

The state of the bowels during the malady seems devoid of all connexion with any special features of the lesion. Constipation is more frequent than diarrhœa, and is in most cases the natural result of the constant vomiting present, and the scanty transit of food into the intestines which that vomiting implies. Diarrhœa is scarcely more frequent than might be expected, supposing it quite independent of the ulcer. Copious hemorrhage, however, may produce it.

Amenorrhœa is certainly a less frequent symptom than is generally supposed. In the chronic ulcer of middle-aged women the catamenia are frequently unaffected; often regular, sometimes profuse. Copious

hemorrhage, however, will generally produce it, the connexion being a very obvious one. The hemorrhage causes the amenorrhœa, just as any other serious bleeding would. In other cases, the amenorrhœa precedes the hemorrhage. But as the absence of the menses seems not to confer any additional risk of such bleeding beyond that present in gastric ulcer generally, there is no reason for regarding it as an independent cause. In like manner, there is rarely any definite correspondence between the bleeding and the menstrual epoch. And a true vicarious menstruation by an open gastric ulcer is almost unknown.

It is chiefly in the young female that this symptom is found, and in connexion with that tendency to perforation which we have already pointed out as characteristic of the ulcer of this period of female life. Even here, though, the amenorrhœa is no invariable rule. Some menstruate copiously, some profusely, even where their chlorotic or cachectic appearance would lead us to suspect the contrary. In many cases, the menses have not *dis*appeared, but merely failed to appear at the usual age. In others, puberty is absent. In one case, dissection showed the supposed female to be a neuter monster. And in general the age of these cases (the average epoch of puberty, and of the year or two immediately following) does not exhibit those fluctuations that would exactly correspond to the epoch of commencing menstruation. From these and other facts we may conclude that the ulcer causes the amenorrhœa which it generally precedes, just as other grave diseases often suppress the menses. And we may conjecture that its producing amenorrhœa chiefly at this age (the symptom often disappearing after awhile, in spite of the continuance of the ulcer) is owing to the comparatively imperfect and immature state of the menstrual function during the period in which nature first establishes it.

The amenorrhœa of the young female is associated with a "chlorotic" state, which is the representative of that *cachexia* which the ulcer rarely fails ultimately to produce in both sexes. This cachexia and the peculiar physiognomy it often imparts, are an important indication of the disease.

Many of the symptoms of *perforation* from gastric ulcer are common to this accident, however produced. After suffering from the preceding symptoms, the patient is attacked (generally after a meal, often during some active or passive movement) with violent pain in the epigastrium, which ushers in the ordinary phenomena of acute peritonitis, ending life in from twenty-four to thirty-six hours. Sometimes the contents of the stomach leak slowly through a film of the ulcerous tissue for some hours or days before the perforation takes place. Sometimes a previous adhesion limits the accident to a part of the cavity of the abdomen, which may ultimately form the sac of a peritoneal abscess, or even the site of a fistula.

The cicatrization and contraction of the ulcer sometimes give rise to dilatation or *ampliation* of the stomach. This state is, however,

producible by other gastric maladies, and would only be distinguishable as due to gastric ulcer by the occurrence of the preceding symptoms.

Diagnosis generally.—It is no exaggeration to say that, as every one of the preceding symptoms may vary, their combination gives rise to so many modifications, that each individual case of ulcer of the stomach is unlike every other. Hence we may especially limit ourselves to considering the two following questions.

1. *What is the minimum of evidence that will justify our affirming the existence of a gastric ulcer during life?*—To this question I should answer, that nothing short of *all* the chief symptoms entitles us to give a decided opinion. The date, duration, and character of the pain are not enough, the addition of vomiting even is insufficient, without the occurrence of hemorrhage to indicate an absolute breach of continuity in the affected organ.

But though these symptoms make up the minimum safe basis of diagnosis, to require them, before permitting ourselves to suspect the lesion, would be a grievous error in practice. To say nothing of those doubtful cases on record, in which the symptoms have not been investigated during life with sufficient exactitude to lay much stress on their alleged obscurities or deficiencies, a careful study of the malady has convinced me that there is no exact limit to the degree in which it may be rendered latent by the absence or the ill-marked characters of some of these symptoms. Indeed, their slow succession in many cases might alone prepare us for the fact, that vomiting may be limited to nausea or regurgitation, and hemorrhage be so scanty and infrequent as to defy the most frequent and sedulous examination of the matters expelled from the stomach by stool or vomit.

It is in such cases that we must make the pathology of the lesion in general supply any casual deficiencies in the physiognomy (if we may so speak) of the case in particular; and must remember that suspicions which fall far short of a definite diagnosis may yet be sufficiently important to dictate the whole plan of treatment. Suppose, for example, that we are consulted by a patient for protracted and severe dyspepsia, which has seriously affected the general health; that we find this dyspepsia especially called forth by proteinous substances, and by hot fluids; that it is associated with pain and tenderness in the epigastrium, and pain in the lower dorsal region, much increased immediately after the ingestion of food, and affected as above described by movement, rest, and posture. In such a case, by treating it as ulcer of the stomach, we may often cure what we cannot justifiably diagnose; and may witness a triumph of the art over the science of medicine which the most laborious pathologist would scarcely be sorry to see more frequent than modern research generally allows it to be.

2. The second question—*With what diseases is gastric ulcer most likely to be confounded?*—could only be fully answered by elaborate details of cases, such as I have no time here to adduce. Dyspepsia,

chronic inflammation, "hypertrophy" and cancer of the stomach, disease of the duodenum, gall-stones, aneurisms, and a variety of other diseases too numerous to mention, all present degrees of resemblance, which the above variations in the symptoms of gastric ulcer render much more suggestive of error than is generally the case in diseases of other organs.

Of all these diseases, however, there is none in which the resemblance is so close, and its detection so important, as in the case of cancer of the stomach; and hence we may enumerate (though we cannot discuss) the chief points by which their differential diagnosis would generally depend. The cancerous disease belongs chiefly to middle and advancing life, rarely dates from more than twelve or eighteen months prior to the death of the patient, is associated with the cancerous cachexia, often with cancerous disease of other organs. In many cases, it forms a hard but moveable tumour in the epigastrium; its hemorrhage is more scanty, and, on the whole, later in the history of the malady; its vomiting expels what the microscope will often show to be cancer-cells. But unless unusually distinct, scarcely one of these characters possesses much independent value. The gastric ulcer is frequent in middle and advancing life; it may destroy life in a few days or weeks; it is often associated with a cachexia that is sometimes almost impossible to distinguish from that of cancer, and is not unfrequently accompanied by disease of other organs that could tolerably simulate secondary cancer. The ulcer, if adherent, may form a tumour. Its pain may affect a lancinating character, or be deferred until some time after meals. Its hemorrhage may have the moderate amount, and the "coffee-grounds" appearance, ordinarily seen in that of cancer. And though it is of course unusual to find these separate contingencies combined together to obscure the diagnosis of any single case, still such instances may and do occur. Once or twice I have myself met with cases in which no definite diagnosis between the two maladies appeared to be justifiable, and in which the moderate ulceration detected many months before death (though complicated with other diseases) has offered no symptoms, during the whole time, that would warrant its being definitely regarded as malignant or the reverse.

Such varieties in the morbid anatomy, the symptoms, the course, and the termination, of this frequent and serious malady, may be best summed up by my briefly repeating the opinions which my researches have long led me to form respecting its *nature* and *causation*.

It is only in a very restricted sense that we can adopt the ordinary nomenclature by which this disease is known in medical treatises. It is generally called *the ulcer*—often the *simple*, or *chronic*, or *perforating ulcer of the stomach*.

Now, as regards the word *ulcer*, an important exception may be taken to its use. The comparison of any large number of specimens conclusively show, that there is no specific or pathological distinction between *ulcer* and *ulceration* of the stomach; and that all the distinctive characters which the most minute description could assign to

either, merge into those of the other by infinite gradations. Whilst each of the other terms emphasized above, is a fair instance of the "*lucus à non lucendo*." The lesion is called *the* ulcer because it is not essentially single in its nature and origin, and is very frequently present in the plural number. It is called the *simple* ulcer because its characters are generally a compound of two processes—of absorption and reaction ; the latter of which certain instances show to be quite independent of the former. It is called the *chronic* ulcer because its rapid progress sometimes penetrates the stomach, and destroys life, in a few days. Finally, it is called the *perforating* ulcer, because, in about seven of every eight cases, it does *not* perforate.

In point of fact, we have every reason for denying the existence of any specific disease that can fairly claim the title of *the ulcer of the stomach*. All the varieties that affect the form, site, numbers, course, and termination of this lesion, seem to be paralleled by similar differences in the causation of the malady, both as regards the organism in general, and the local mischief. We have, indeed, no more right to talk of "*the* ulcer of the stomach" than of "*the* ulcer of the leg"—no more reason to assume that the gastric lesion invariably begins by any special occurrence (such as hemorrhage, softening, or submucous deposit) than we have to restrict the beginning of what is evidently a similar process of destructive absorption in the limb to an ecchymosis, a pimple, an abscess, a burn, or an obstructed vein. And, just as experience proves, that ordinary cutaneous ulcers may begin by either of these lesions, retaining a general identity of the subsequent ulcerative process, so all the facts that can be brought together respecting the ulcer of the stomach point to a similar conclusion. It is only thus we can explain its ascertained relation to many diseases, and to various physiological conditions. Ague, fever, or the vascular disturbances of female puberty might, perhaps, cause ecchymosis ; but to convert this effusion into a spreading ulcer, would require a process of absorption which no mere extravasation would explain. The influence of old age, privation, and fatigue, again, throw little light on the local change that ushers in the ulceration, but exactly concur with the known efficacy of these circumstances in the promotion of ulceration elsewhere. In like manner, to grant that the circumstances of digestion often retard the healing of a gastric ulcer, is to concede nothing more than may be observed in an ulcer of the leg, where such physical circumstances as posture, pressure, and the like, equally influence the result. Nay, more, that the analogy extends to the minutest details, is well shown by comparing the gastric and the cutaneous ulcer of the young female. During the epoch which immediately follows the access of puberty in the female, both these varieties of ulceration—the ulcer of the stomach and the ulcer of the leg—are marked by an absence of reaction in the lesion, and are generally followed by cachexia, by more or less amenorrhœa, and, lastly, by an aggravation of the local symptoms at the menstrual periods.—*Lancet, October* 4, 1856, *p.* 373.

29.—ON SYNCOPE SENILIS, ARISING FROM GASTRIC IRRITATION.

By John Higginbottom, Esq., F.R.S., Nottingham.

[This complaint is common to all ages, but more particularly to infancy and old age. It is generally observed in persons above sixty, and takes place without any organic disease, although both the vascular and nervous systems must be inactive and in an impaired condition. Mr. Higginbottom says]

In the cases I have attended of syncope senilis, gastric irritation appears to have been the sole cause of the attack. At that advanced age, mastication of the food is very imperfectly or not at all performed for want of teeth; solid animal food has been eaten when the stomach has been in an unfit state to assimilate it, usually after having had a longer walk than the patient has been accustomed to, or had more muscular exertion than usual, so as to produce fatigue, and sometimes after exposure to cold; all which tend to weaken the power of the stomach. On this account the food remains an indigestible mass in the stomach, and gives rise to gastric irritation, producing syncope and convulsion, which sometimes follows, often slight at first, but becoming more formidable, or even fatal, if proper remedies are not promptly used.

I was called to a patient about three o'clock in the morning, his wife having been awoke by his hard breathing and noise in his throat. She found her husband was in a fit. I was directly sent for. When I arrived he had partially recovered, but very soon after he had a second fit, which had the appearance of a slight attack of epilepsy, attended with convulsion, but had no bitten tongue, as is usual in severe attacks of epilepsy. As soon as he was sufficiently recovered from the attack, so that he could swallow, I gave him half a drachm of the powder of ipecacuanha with fifteen grains of the bicarbonate of potass, which was followed by full vomiting; he ejected lumps of solid beef, which appeared to have been swallowed, or rather bolted, without having been masticated at all; one of the pieces, I observed, was about an inch long and three quarters of an inch in thickness. Although the food had been taken into the stomach about sixteen hours, the acute corners and edges of the beef appeared as if just cut with a sharp knife, not the least digested. No further remedy was required after the emetic, but attention to the bowels, which he reluctantly submitted to, saying he was quite well.

In a month afterwards he had another fit of a similar nature. He fell down in a moment on the floor, and remained in the same state as in the former case for half an hour: the same remedies were resorted to as before, and he recovered quickly. I expect the patient will have a return of the syncope, as he is very wilful, and will not attend to any means of prevention. This patient was the youngest,

being 68 years of age. Previous to the first fit he had been using much muscular exertion, still being active in business.

Another case is that of an old patient of 86 years, who at intervals of a few weeks had several similar attacks of syncope. After the last fit, attended with slight convulsion, I was induced to think it had been occasioned by taking solid food, which was swallowed after imperfect mastication; on that account I forbade him the use of animal food altogether. This regimen he has now strictly adhered to for some months, except a few times having taken a small quantity of tripe. He has had no return of his fainting fit, a much longer time having now elapsed than the interval after which he had several of the previous attacks. I would make an observation here, as a contrast to the former case I have related in the younger man, that at a more advanced age the patient does not recover so quickly from the attack but requires particular attention to the digestive organs for some days, with gentle aperients, and saline medicine in a state of effervescence.

It is not unusual for even young men to have similar attacks from indigestion, when sudden syncope for a short period comes on, recovery taking place in a few moments. The same attack at an advanced age, I presume, would be attended with aggravated symptoms, such as those I have witnessed.

[The lamentable illness and death of the Duke of Wellington appears to have been a case of "syncope senilis." With respect to the treatment of the Duke, he says,]

I fully concur with the leading article in the Lancet, and with Dr. Marshall Hall's opinion, that an efficient vomiting at an early period would have been a most effectual remedy.

I know no emetic equal in such a case to half a drachm of the powder of ipecacuanha, with the addition of ten or fifteen grains of the bicarbonate of potass, as it corrects any acidity in the stomach, and produces full vomiting both safely and quickly; it has also the power of raising the system to its normal condition, without producing any unnatural excitement, and promotes the healthy secretions of the various organs of the body. The nausea and inefficient vomiting arising from natural efforts to empty the stomach, I have no doubt produces debility and exhaustion, when a full vomiting from ipecacuanha has the contrary effect. Should the first half-drachm of ipecacuanha not operate, a second such dose may be given with the greatest safety, it only having the effect of a more speedy operation. If vomiting still should not follow, the fauces might be irritated with a feather, to excite it. I have for the last forty years given ipecacuanha emetics with the same freedom as I have purgatives, and never saw any bad result.

It might be thought by some individuals that abstaining from animal food at the period of old age might be attended with the loss of health and strength. I had an instance in a relation of my own family, who, at seventy years of age, quite abstained from animal food, and also from wine. After the lapse of ten years, when at the age of

eighty he was requested by his relatives to resume his animal food and wine, he excused himself from taking either of them by saying he did not want them, for he was very healthy, and in good spirits, although very thin in body. He lived till he was nearly ninety years of age. This old gentleman, I apprehend, would have been a likely subject for the syncope senilis had he been in the habit of taking solid animal food, which he could not masticate, and which most probably would have shortened his days.

At an advanced age, when the physical powers of the body are declining, and second childhood approaching, and at that period when comparatively little exercise only can be taken, the body does not require the same solid food. Nature points out the use of milk and light farinaceous matter as an aliment, as being more natural, and adapted to that period of life; such food alone is sufficient to keep the body in a healthy, cheerful, and happy state. It has been erroneously stated that "wine is the milk of old age;" I believe the truth is, that milk is the wine of old age, for both the first and second childhood, the most natural and the most nutritious. Dr. Erasmus Darwin used to say, "Milk is white blood." The oldest individuals I have known, have lived principally upon milk diet. Second childhood may be treated much in the way as directed by the late Dr. James Hamilton, professor of midwifery in the University of Edinburgh: "Plenty of milk, plenty of flannel, and plenty of sleep or rest."—*Lancet, April* 26, 1856, *p.* 453.

30.—*On Flatulence.* By Dr. T. K. Chambers.—Flatus, of which the smell is not that of healthy fæces, but of decomposed organic matter, indicates that the duty of the physician lies in restoring some decided deficiency in the process of digestion. Most commonly it is the liver and small intestines which are wanting in activity, so that the stools are scanty, slimy, and irregular. The most effectual remedy is mercury, in small doses, combined with light vegetable tonics—such, for instance, as a nightly powder of hydrargyrum cum cretâ, and a dose of decoction of sarsaparilla, or infusion of gentian, or of red bark, thrice a-day. The quantity of unabsorbable woody fibre which is contained in these vegetable medicines appears to be an advantage, as it carries the active portion of the drug lower down the alimentary canal, and perhaps also is useful in forming a more bulky fæculent mass. The dietary should be sparing, and all difficultly soluble albuminous articles should be avoided; such, for instance, as solid white of egg, or meat pastry. Warning also should be especially given against food in a state of half decomposition, such as game long kept, stale fish, ripe cheese, medlars, sour beer, half-fermented champaigne, &c. These not only decompose themselves, but cause all that surrounds them to decompose too, turning wholesome victuals into noxious poison.—*Brit. and For. Med.-Chir. Review, July,* 1856, *p.* 55.

31.—*On the Treatment of Chronic Dysentery.* By R. W. Ellis, Esq., Bristol.—[In dysentery, the large intestines are the parts principally affected. When the functions of the colon are performed in a healthy manner, the fæces are properly formed; but in dysentery, this character of the fæces is lost, owing to some fault of the colon.]

The compound tincture of benzoin I have found, when administered in this disease, particularly useful in restoring, and that in a very short time, this function of the colon. Whether it also acts beneficially by protecting and sheathing the ulcerated portions of the gut, or by its stimulating qualities induces, just as it does in chronic ulcers of the surface, the reparative processes to go on more rapidly, I am unable to determine. The tincture of benzoin, I need scarcely say, consists of benzoin, styrax, tolu, a small quantity of aloes, and spirit. The dose generally given is from fifteen to twenty minims. The following case I have extracted from my note-book, as being the most striking instances that I have met with of its beneficial effects:—

Case.—C. S., aged 50, female, married, the mother of several children, has suffered for years from diarrhœa with tenesmus and discharge of blood per anum; no piles. Has been in the habit of taking drops of the tincture of sesquichloride of iron, as prescribed for her by a physician, and with benefit. Has suffered from her complaint in an aggravated form since last Christmas, and has lately taken a great deal of medicine for it without relief. At present (May 29, 1855) she passes a great deal of blood by stool; pain great; bowels loose; blood mixed with the stool; breath short; lips very pale; countenance exsanguine.

Ordered twenty drops of compound tincture of benzoin, to be taken on sugar three times a day.

June 1st. Has not passed any blood since the third dose; feels better; is stronger, and has more appetite; lips rosy; more colour in cheeks, and expresses herself as "wonderfully better."

3rd. Ordered twenty drops of the tincture of sesquichloride of iron, one ounce of the infusion of calumba, to be taken twice a day; one grain of compound calomel pill, every night.

July 24th. Still continues much better; the pills act gently on the bowels.—*Lancet, August* 23, 1856, *p.* 221.

32.—ON NUX VOMICA IN CONSTIPATION.

By J. H. Houghton, Esq., Dudley.

[We are constantly consulted by patients who tell us that they hardly ever have their bowels moved without taking medicine. They have generally tried every kind which we can recommend, and the only consolation we can give them is, that they must ring the changes and increase the doses. The effect of this is often only to aggravate the mischief and hasten on some of the thousand-and-one ill conse-

quences which we may expect from such a state of affairs. As the result of much experience, Mr. Houghton says that in nux vomica we have a remedy capable of relieving many cases of this nature, of which he gives the following :—]

Case 1. December 4th. Emma Gibbs, aged 29, came under my care at the dispensary on October 3rd, suffering from an attack of congestion of the uterus and vagina, which yielded to local depletion, rest, baths, &c. She is naturally of a delicate frame and constitution, and was left very much debilitated by the attack. She got relief to her debility by taking quinine and iron ; but during the whole of the time her bowels were unmanageable and obstinately costive. To relieve this, she has taken, and had given to her, castor oil, senna mixture, pills, and, last of all, pills containing two parts of colocynth and one of henbane. Of these, at first, she took two with relief ; then three became necessary, and then four ; she then took four at night, and followed it by castor oil in the morning, and thus obtained a motion once in two or three days with much pain and trouble. On the 13th of November I gave her twelve pills, consisting of ℥ss of henbane, ℈j of compound extract of colocynth, and gr. iij of extract of nux vomica, and desired her to take one every night, and to continue her tonics as usual. From that time to the present (three weeks) she has taken one pill every night, and had one comfortable motion every morning without the aid of any other aperient, and her health has much improved.

Case 2. Sarah Silvester, aged 35, applied to the dispensary on December 16th, suffering from a severe attack of gastrodynia, attended by some derangement of the uterus. I extract the following from my notes. Tongue furred, yellow, indented by the teeth, moist. Appetite bad ; violent pain after eating, worse at times ; frequent regurgitation of food, sometimes vomiting ; sometimes she is compelled to produce vomiting before she can get relief after eating. Bowels habitually costive, and very unmanageable. Her habit is to take medicine twice a week, after which she has two or three stools, and then the bowels do not act again till she again takes medicine. She says she has taken "all sorts of medicine," including many quack pills, for the relief of her bowels, but only with temporary benefit, the bowels returning to their inactive state. She had bismuth three times a day, and the pill before named every night.

December 19th. One motion daily, with perfect comfort ; she has not been so comfortable in her bowels for years. Gastrodynia and vomiting much relieved.

January 16th (thirty-two days). She has taken one pill every night, and had one motion every day with comfort. The pills have never missed. Her stomach symptoms are relieved.

February 13th. She was at the dispensary to-day. She has taken one pill every night, now two months, and it has never failed.

Authorities are very silent on the peculiar property of the nux vomica which I am now discussing. The last edition of "The Pharmacopœia Londinensis' dismisses the whole matter in these laconic words: "Use—in some cases of paralysis."

Pereira does not allude to it, though he speaks of the efficacy of the drug in "dyspepsia, pyrosis, and some forms of dysentery."

Dr. Copland, whose mind seems to have embraced almost everything in medical science, says, "In cases apparently depending on deficient tone of the muscular coat of the large bowels, and imperfect propelling power of the upper part of the rectum, I have seen benefit from combining the extract of nux vomica with the pilula aloes c. myrrhâ or compound extract of colocynth."

Dr. Neligan, in his excellent treatise 'On the Uses and Modes of Administration of Medicines,' observes: "I have used the extract of nux vomica with much advantage as an addition to purgatives in constipation depending on want of tone in the muscular coat of the large intestines, one of the most frequent causes of this state in females, and one which is distinctly characterised by great secretion of flatus, and colicky pains which accompany it."

So far as I have been able to learn, we are indebted to Magendie for the first suggestion on the powers of the nux vomica. In 1845, Dr. Tessier, of Lyons, published a paper which was quoted in 'The Lancet,' and in which he says that "he considers it particularly indicated in cases where there is reason to suspect general want of tone in the bowels, as in paralytic and old persons, or where we suspect want of tone of the muscular coat, in consequence of great and long-continued distension; or, in short, where the constipation can be referred to an undue secretion of gas, which in itself, by causing distension of the bowels, diminishes their contractile power."

In the Journal of this association for May, 1848, is an article by Mr. Boult, of Bath, on the employment of nux vomica in habitual constipation, in which he observes: "I first tried the extract alone, in half-grain doses, two or three times a day, and was disappointed with the result. I was then led to use the extract in combination with aloes, rhubarb, and scammony, and was surprised at the result." Mr. Boult seems to think *that it has the power of increasing* the action of other purgatives; and he says: "Generally speaking, a pill containing three-quarters of a grain of Barbadoes aloes, three-quarters of a grain of extract of rhubarb, and half a grain of extract of nux vomica, taken at bed-time, will produce one or two full evacuations the next morning." And he continues: "I have prescribed the pill already mentioned for months together, and at the end of that time the effect has been produced as certainly as at first, and no bad consequence has arisen: on the contrary, I think it will be found that, when the medicine is discontinued, the tendency to costiveness will be found to be diminished."

The correspondent of 'The Medical Gazette,' November 10th, 1855,

in his Notes on Hospital Therapeutics, has the following admirable remarks on the subject: "Among the conditions over which nux vomica, and its active principle, strychnia, possess most useful powers, is that of habitual constipation from muscular atony of the intestinal tube. At the City Hospital for Diseases of the Chest, we observe that Dr. Peacock and Dr. Andrew Clarke are both in the habit of frequently resorting to it for this purpose. It is generally given in combination with the compound rhubarb pill, and in doses of the extract of from one-sixth to one-half a grain. Of itself it *can scarcely be deemed an aperient;* that is, it does not so much excite peristaltic action as supply tone to the weakened muscular coat, by which it is enabled to reply efficiently to other irritants. Hence the need of combination with aloes, rhubarb, or some similar drug."

Dr. Peacock has mentioned to us a case in which a man of feeble intellect and torpid nervous system generally had derived great benefit from its employment. At first, the bowels were obstinately costive, and lavements produced no action; but since the use of nux vomica they have so far increased in power and susceptibility that simple injections are quite sufficient to procure all the action that is necessary.

With the observations quoted I generally concur, but specially with those of Mr. Boult and of the correspondent of 'The Medical Gazette.'

From the facts and opinions adduced I think we may safely infer—

1. That in the nux vomica we have a new agent in the treatment of constipation: not a purgative or aperient, but a substance which, added to very minute doses of various purgatives and aperients, forms a kind of *tertium quid*, which combines the advantages of purgatives without the disadvantages, which does not leave the bowels debilitated and indisposed to act after its operation, but which, on the contrary, imparts tone, rendering their action more certain.

2. That the agent does not lose its power by continued use.

3. That it is a perfectly safe remedy when used in the mode suggested.

4. That it is not an accumulative medicine.—*Association Medical Journal, April* 5, 1856, *p.* 271.

33.—*Santonin as an Anthelmintic.* By G. G. Perry, Esq., Droxford.—[The very satisfactory effects of santonin in expelling round and thread intestinal worms are not generally known. Mr. Perry, who has tried its effects in many cases, says:]

Among the first cases treated, was that of a child of two years of age, to whom I gave three grains of santonin, followed in two hours by an aperient powder; this child voided the next morning, at one time, thirty-seven worms, some of them a foot in length, of the lumbricoid genus kind. Two children in another family were similarly treated,

and between forty and fifty worms came from each ; again, in a family of four, 124 worms at one time, and many more afterwards, followed the aperient, each child having taken one dose of santonin. I could instance many more cases which have been relieved by this medicine. After the expulsion of the worms, I give a tonic mixture, containing the muriated tincture of iron and muriatic acid, and change the diet from a vegetable one to that of meat and bread. My cases all do very well.

I should state that santonin is a medicine that may be administered with perfect safety. I give it in its crystallized form, between bread and butter, and two hours after it a dose of calomel and jalap ; in some cases an interval of twenty-four hours occurs before the worms are voided.

The persons who reside in the locality in which I have met with these cases, are very poor, and, from the high price of bread this winter, have had recourse to vegetables of the commonest description, as an article of food, which will account for the presence of worms in the alimentary canal.—*Med. Times and Gazette, May* 17, 1856, *p.* 492.

34.—TREATMENT OF TAPEWORM BY THE OIL OF MALE FERN.

By Dr. William Jenner, Physician to University College Hospital.

In the treatment of tapeworm, we have to keep three objects in view; viz.—

1. The expulsion of the entozoon ;

2. The prevention of the entrance of another scolex of tænia into the patient;

3. The improvement of the health of the patient, so that his intestines may no longer form a favourable nidus for the development of the scolex into a tænia.

The two last objects are to be attained by directing the patient to live well, but to avoid pork and imperfectly cooked meats of all kinds. Spices, onions, and garlic, should be used with the food. Spirits and wine are to be preferred to beer. Beer, especially if it contains but little hop, is thought by some most experienced German physicians to be highly favourable to the development of tapeworm. Mild aperients, vegetable bitters, steel, and zinc, are the medicines in which most confidence is to be placed. Out-door exercise is essential.

For the expulsion of the worm, various agents have been employed with success. As the animal increases in length, by the formation of new joints, at the neck close to the head, it is no matter how many yards are removed, provided the head remains ; for, in that case, the worm quickly grows to its original length. No remedy, then, is successful which does not expel the head. But, although this is true, and tapeworm is a common enough disease, many practitioners have never seen the head of a tapeworm.

The anthelmintics chiefly employed in cases of tapeworm in this country are turpentine, kousso, pomegranate, and male fern. The objection to turpentine is its horribly nauseous flavour, and its very unpleasant effects on the head, and occasionally on the kidneys. It is a remedy which should be used only as a last resource. Kousso is expensive and bulky. Pomegranate is bulky and nauseous, and, as ordinarily obtained in this country, not very certain in its action. Male fern has the advantages of being inexpensive, only moderately disagreeable in flavour, so that children take it readily, of small bulk, perfectly innocuous to the patient, and more certain than the other agents in its action on the parasite. It is one of the oldest of the remedies for tapeworm, and one of the very best. The preparation I have used is the etherial oil. An aperient was given in the morning, the patient was kept without food for sixteen or eighteen hours, and then one or two drachms of the oil of male fern were administered on a little cinnamon water.

I have notes of twenty-four cases to which the oil of male fern was given. Sixteen of these cases were cured by a single dose. In three of these sixteen cases the head was found; three of the remaining thirteen were ascertained to be well two years after the administration of the oil, one a year after, one seven months, two six months, three four months, one three months; and before the other two ceased to be under observation, a second dose was given by way of precaution, as it was to all the patients when the head was not found, without any tænia coming away with the stool.

Three required two doses of the drug; in one of these three some yards of tænia were expelled by the first dose; for two months after this no joints were found in the stools, then a few appeared, and a second dose was given, and was followed by the expulsion of nine yards of tænia; the patient continued well two years after this. In the second case, three yards were expelled by the first dose, and a month after, five feet by a second dose; at the expiration of four months and a-half the patient continued well; in the third case five and a-half yards of tænia were expelled by the first dose, and seven yards by the second, given two months after the first.

These doses were required in two cases. The first dose of the oil, however, given to one of these cases was not of good quality. In one of the two, three days elapsed between the first and second dose, and four hours between the second and third. In the other, two days elapsed between the first and second dose, and one between the second and third. In both cases the head was obtained.

In one case, viz., that of a child five years and six months old, between the 15th of July and the 4th of August inclusive, five doses of castor oil, and as many of oil of male fern, were administered, without a decided effect—a few joints of tænia only being expelled. On the 17th of August, twenty grains of the extract of male fern, obtained

from Duncan and Flockhart, of Edinburgh, were given without effect. On August 23rd. one pint of infusion of pumpkin seeds; on September 1st, decoction of pomegranate; and on September 5th, infusion of kousso; all produced copious evacuations, but no tapeworm. The child now left the hospital. In November he was readmitted, and during my absence was treated with success by my friend Dr. Ballard with the oil of male fern. This time the child was kept for forty-eight hours with little if any food, before the oil was given. The child was free from tapeworm some months after he left the hospital.

One man took the oil two or three times without any good effect, but then large quantities of solid fæces were discharged from its action; and before it could be administered in a more effectual manner, the patient escaped observation.

Among those cured by a single dose, and well two years afterwards, was one man who had taken kousso three times, and oil of turpentine twice. Several of the others had taken turpentine and other remedies with permanent good effect. In three cases (children) the patients rejected the oil by vomiting; with one exception, all admitted that it was much less nauseous than castor oil. In no case did it cause griping or other unpleasant symptom. The shortest time after taking the oil in which the worm was expelled was half an hour; the longest twelve hours; the ordinary time four hours. A large quantity of tenacious yellow mucus was usually expelled either with or before the worm, and often, also, when no worm was present, as when the oil was given to ascertain that no worm remained, the head not having been found.

In no case was the worm alive when expelled, and in no case was it expelled entire.

The mode of administering the oil of male fern, I would recommend, after the experience I have had of it, is as follows:—

For an adult, two pills may be taken at bedtime, containing three grains of calomel and eight of compound colocynth pill—the following morning a dose of castor oil. A little broth only should be given till the bowels have been thoroughly cleared out. As soon as that object is effected, one drachm and a-half of oil of male fern is to be given on an ounce of some aromatic water; and the dose of oil of male fern is to be repeated in six hours, if the first dose has not proved effectual before the expiration of that time.

For a child, calomel and jalap may be substituted for the colocynth and calomel. The dose of the oil of male fern must be as large for the child as for the adult, seeing that its action is on the parasite and not on the patient. I have never seen any unpleasant results follow its employment in the child.—*Association Med. Journal, August* 23, 1856, *p.* 718.

35.—ON HEPATIC DROPSY.

By Dr. G. Burrows, F.R.S., Physician to St. Bartholomew's Hospital.

[In a clinical lecture on this subject, Dr. Burrows first noticed the symptoms which most commonly attend these cases. They may be briefly mentioned, as, a swollen prominent abdomen, distinct fluctuation, sallow complexion, slightly jaundiced conjunctiva, pain and tenderness in the right hypochondrium, hard mass projecting below the ribs towards the umbilicus, high-coloured scanty urine, slight fever. Most frequently these symptoms will have been produced by intemperate habits, which generally bring on cirrhosis of the liver.]

The treatment of dropsy is, at all times, confessedly difficult; but, according to my experience, these cases of hepatic dropsy are not so intractable as they are represented to be, in some modern treatises on diseases of the liver.

The first measure to be adopted will depend greatly upon the duration of the complaint. If the patient complain of pain in the right hypochondrium, or if there be tenderness there on pressure, together with febrile excitement, and the strength of the pulse will permit, I recommend you to resort to local depletion. A few ounces of blood may be taken by the cupping glasses or by leeches, from the region of the liver, and this depletion should soon be followed by the application of one or more blisters in the same region. In many cases the symptoms hardly call for vascular depletion, and we commence the local treatment by the application of a blister.

2ndly. Evacuate the intestines by a freely acting purgative, and repeat this once or twice in the week; this evacuation affords relief, and, I think, is less distressing to the patient, and less irritating to the alimentary canal, than the daily use of less active aperients.

3rdly. Having premised these measures, I advise you to lose no further time in resorting to the internal and external use of mercury, not in such doses as to affect the system rapidly, and as would be proper in cases of acute hepatitis, but very gradually.

I usually prescribe the pil. hydrarg. gr. iv. cum pulv. scillæ gr. j., nocte maneque, and find this quite sufficient for the purpose. But then, as soon as the blistered surfaces will permit, I order mercurial friction over the abdomen twice in twenty-four hours, and here I prefer the stimulating effects of the lin. hydrarg. to the simple inunction with the ung. hydrarg. According to my experience, there is no remedy so powerful in exciting the absorption of the products of inflammation within the abdomen, or of fluid from the peritoneum, or of stimulating the liver to increased secretion, or the intestines to more energetic peristaltic action, as mercurial frictions over the abdomen. This remedy is not only, in my hands, most efficacious in the treatment of ascites arising from chronic hepatitis, but also of inflammatory effusions within the abdomen; and likewise in obstinate constipation, sometimes erroneously supposed to depend upon mechanical

obstruction of the bowels. I advise you to place confidence in these means in the treatment of ascites depending on cirrhosis; but remember it will be necessary to sustain the mercurial action for several weeks. It may be necessary to suspend the mercurial friction occasionally, and then, if any tenderness be detected in the epigastrium or hypochondrium, a blister may be applied there.

4thly. Simultaneously with this use of mercurials, you may employ diuretics freely, if careful analysis assures you the urine is free from albumen. Some writers of high repute upon diseases of the liver speak disparagingly or doubtingly of the efficacy of diuretics in this form of dropsy, or of the ability to reduce ascites by the use of diuretics. This latter class of remedies are notoriously uncertain in their operation, but nevertheless, I have found them far from useless in the treatment of ascites, especially where they have been combined with the remedies already enumerated. The diuretics I prefer are the salts of potash combined with sp. æth. nit. and sp. juniperi comp. I generally combine two or more of the following salts of potash in varying proportions —the potassæ bicarb., potassæ acetas, potassæ tartras, potassæ nitras, and potassæ iodid. When this plan of treatment has not a sensible effect in diminishing the ascites in the course of three weeks or a month, I should recommend you to resort to paracentesis abdominis at once, and not wait until abdominal distension has become enormous and the different internal organs almost paralysed in their functions by the long-continued pressure of the effused fluid.

Many advantages may be derived from one operation of tapping, which will not follow upon its repetition; indeed, the frequent withdrawal of the fluid by tapping causes much exhaustion, and may be followed by fatal peritonitis. The first removal of the fluid generally affords great temporary relief to the patient, but other advantages may be expected from the operation. If the operator's hand be carefully passed over the right side of the abdomen, when it is emptied of the fluid, he may ascertain with more exactness the real condition of the liver, whether it be enlarged or small, or retracted; whether its upper surface be smooth or nodulated by deposits in its substance. Such information may encourage a persistence in former treatment, or may dissuade from the use of all further exhausting remedies. Moreover, it not uncommonly happens that, while the abdomen is enormously distended, diuretics and purgatives have little or no effect; but that, when the internal pressure is removed, the kidneys and bowels begin to evince their susceptibility to the influence of remedies previously administered with no success.

Lastly, I may warn you, that patients labouring under this form of dropsy have generally been accustomed to intemperate habits, and will not bear a very low diet. A moderate quantity of dry nutritious food is better digested than slops, and you will find the nervous system and the flatulent stomach require a small amount of some stimulant daily.—*Med. Times and Gazette, July* 19, 1856, *p.* 53.

36.—ON LARDACEOUS DISEASE.

By Dr. Samuel Wilks, Assistant Physician to Guy's Hospital.

[The name lardaceous has been given to a peculiar condition of the liver, and may be applied also to the similar affections of the spleen, kidneys, lymphatic glands, &c. The disease is often associated with manifestations of scrofula in other parts of the body, and there can be no doubt but that the strumous and lardaceous conditions are nearly allied. The most extreme examples of this morbid change have been found in connection with chronic disease of the bone in young persons, which has a constitutional origin, and which is generally styled scrofulous. Our present experience clearly proves that the lardaceous disease is more intimately connected with affections of the osseous system than with any other class of maladies. The best forms of the disease have been met with in the liver, but recent observations show that both the spleen and the kidneys are very commonly affected in a similar manner.]

The first question for inquiry is, what is the nature of this lardaceous disease, and how does it affect the organs which are the subject of it? Pathological investigations of late years have shown that the textures of the body may undergo a variety of changes or degenerations, and thus, as formerly every process was called inflammatory and every change the result of inflammation, so now we recognise the replacement of healthy tissue by fat, fibre (besides into the previously well-known cancer and tubercle), and many other products, amongst which is the lardaceous material, a principle which appears to be altogether peculiar, and one formerly much overlooked. There are, no doubt, also various other materials produced in the different morbid processes which are so constantly being set up in the body, and it may be that those found in the lymphatic glands and spleen, presently to be mentioned, are of a peculiar kind.

The name lardaceous takes its origin from the resemblance which the liver has, when thus affected, to bacon rind. The cut surface of the organ has a semitransparent appearance, presenting no structure, and feeling, when incised, like a piece of wax, or of wax and lard combined. It can thus be cut into portions of the most regular shape, with the sharpest angles and smoothest surfaces; the thinnes. slice can also be taken off by the scalpel for microscopic purposes. There is little change produced in it by water or alcohol, and acids and alkalies do not effect any great alteration in it. It is thus remarkably inert, and may be kept for a great length of time without any signs of decomposition. As regards the nature of the lardaceous substance, it is not composed of fat, nor is it wax or gelatine, or any of the ordinarily well-known animal substances, but an albuminous compound, altogether differing from these, and therefore quite deserving of a new name. When affecting organs in too slight a degree to be recognisable by the naked eye, it is seen by the microscope in the form of rounded

or oval masses like horn, presenting no structure, and quite unaffected by the application of ordinary reagents.

The very lax expression *colloid* has been used by some pathologists to designate a transparent viscid fluid or solid substance, found under a great variety of circumstances in all parts of the body, including the disease of which we are speaking. Nothing, however, but confusion can result from making use of the same name to designate the gelatinous-like matter contained in the so-called colloid cancer, the fluid found in cystic disease of the ovary, the material of numerous cysts in other parts of the body, as in the thyroid gland, and the lardaceous disease now under consideration. The term, however, has even had a much wider application than this, and has been used to designate all those amorphous bodies detected by the microscope in almost every degenerated structure of the human frame, such as the corpora amylacea of the brain. If the same chemical composition be discovered in all these substances, and under all these different conditions, then it will be time enough to make use of a common expression for their designation ; but, at present, the circumstances under which they are found, including their whole clinical history, are so different, that no advantage appears to be gained by using so ill-defined an expression as colloid to include them all. The fact is, that there is scarcely an organ in the body, under certain conditions of disease, but which will exhibit amorphous, vitreous-looking masses, by the microscope, and which cannot be distinguished from the ordinary lardaceous material when small quantities of it are examined at a time. To say, however, that the two are alike, would be almost equivalent to declaring that tissues undergoing degeneration form within themselves, among other changes, a certain peculiar albuminous product, which, if occurring in excess, is no other than the well-marked lardaceous material. This may be true, but is not yet proved ; and there are many reasons against adopting such an opinion—the lardaceous change being one analogous to the cancerous or tuberculous, whereas the other condition, so frequently found in all organs, is simply a degeneration, as is proved by the presence of cholesterine and other substances of recognised low or deficient organization. In a wasted eye which we lately examined, the contents consisted mainly of a number of these bodies called colloid and cholesterine. These may be also found in the kidney, and particularly in the brain and spinal cord, when long atrophied. In cancer, especially in the epithelial form, they are found in abundance ; and apparently similar bodies are occasionally met with in the blood, as described by Gulliver and Hassall. In wasted nervous structures, even another material has been mentioned under the same name, the so-called corpora amylacea. These, probably, have been originally the colloid bodies resulting from the formation of new products in a decaying brain, and then undergoing a further change, until they are capable of being coloured blue by iodine. It may be as well

to state that iodine does not effect this change on the ordinary colloid or lardaceous material, although these substances very readily absorb the test, and thus become coloured by it. They appear of a bright cherry-red colour, while the ordinary tissue retains its original pale hue. From many observations, we can say, that ordinary lardaceous or colloid matter is not turned blue by iodine and sulphuric acid, as some appear to suppose. With regard to the effect of these reagents upon the so-called corpora amylacea, this is a point foreign to our subject; but we may state that the true nature of these latter bodies is not yet satisfactorily shown, whether they be really starch, lignine, or other allied material.

Lardaceous liver.—In its extreme form the peculiarity of this disease is very great. The increase of size of the organ is immediately recognised, and, when removed and handled, its more than corresponding density is very remarkable. A liver which at first sight appears to be simply a fat one, may often be known to be pervaded by lardaceous matter by its excessive weight, even before a section is made of it; and this is easily intelligible, when it is stated that the fatty liver sometimes attains as low a specific gravity as 1005, whereas the lardaceous may reach as high as 1085. The sensation upon handling a liver pervaded by this material is very different from that produced by the softness and elasticity of ordinary healthy viscera, being more like that which is experienced in feeling a lump of wax. Its resemblance to this substance is increased by the fact of the organ being moulded to the form of the other viscera with which it comes in contact, having its sides straight, its front flat, and its under surface shapen hollow, to correspond to the kidneys and spleen. When cut, however, the knife passes more readily through than it would through wax, the lardaceous substance being crisper than the latter; and this has suggested its resemblance rather to a turnip. A turnip, on the other hand, is too hard, and therefore, probably, a material imagined to be equal in consistence to these two substances combined would be nearer the truth. In well-marked instances of the disease, the solidity and firmness of the organ is very remarkable, so that the thinnest slice can easily be cut by the scalpel for microscopical purposes, and pieces of all shapes, presenting the acutest angles and sharpest edges, can be readily removed. The appearance to the eye is something like the bacon rind, from which it derives its name, being too translucent for wax, except the latter be seen in a melted state. If the disease be far advanced, the organ will present in its interior no trace of structure, except here and there a blood-vessel, emitting a pale watery blood, the adventitious material presenting merely a uniform smooth surface. In a less degree of disease, such as is generally found towards the circumference of the viscus, the lobules are mapped out in a remarkably clear and defined manner; in fact, in no disease of the liver is the appearance of lobules (which, as a

rule, are not marked) so distinct as in this particular morbid condition. This is caused by the lardaceous material being deposited within the lobule, in and among the secreting cells, causing it to appear as a distinct transparent body, and made more definite, often, by a slight fatty degeneration of its margin; for this fat, being mixed with the lardaceous matter, produces an opaque white material, which passes completely around and amongst the lobules, mapping them out in the most perfect manner. Towards the edges of a lardaceous liver, then, this appearance is generally seen—a dead white opaque matter running in the course of the portal vessels, and between these the transparent lobules themselves, with the hepatic vein in their centre. Fat is no essential element of the disease, for the most extreme instances do not contain it, except it may be towards the circumference of the organ, as already stated. In cases of phthisis, however, we often see the two coexisting: the liver may appear to the eye only yellow and fatty, but at the same time remarkably heavy; and when a section is made, the structure will be seen to be composed of the two morbid conditions, in various proportions. Probably, towards the circumference the organ will be yellow, soft, and altogether fatty, while in the centre the same appearance will be seen, but pervading it there will be the ordinary-looking, translucent, firm lardaceous matter. By the microscope, the peculiar element which has changed the organ appears only as a refracting, corneous-looking substance, of no particular form or structure. In the portions of the liver less affected, this substance is seen mixed with the secreting cells in the lobules, the cells themselves having a withered appearance, being small and almost devoid of granular contents. If the circumference of the liver has become fatty, the appearance of lobules under the microscope, with their dark opaque margins, becomes very well marked. In some cases an increase of fibrous tissue has appeared to be present, but whether this has been an essential part of the morbid change, or whether it has been due merely to a coincidence of the lardaceous degeneration with an early cirrhosis, it is difficult to say. The lardaceous liver is little prone to change; it is not much affected by water, alcohol, acids, alkalies, or ordinary reagents; and may be kept for a great length of time without any odour being emitted, or other signs of decomposition manifesting themselves.

Lardaceous spleen.—There are three conditions of the spleen to be found in connection with the disease under consideration. Although only one, probably, can strictly bear the name lardaceous, the others have, no doubt, strong ties of relationship with it. The first, or true affection, is recognised by the presence of round translucent bodies, pervading the structure of the organ, occupying, in fact, the place of the ordinary splenic or Malpighian corpuscles. These bodies are about the size of millet seeds, although they vary in size according to the degree of the disease. In the most extreme cases they never

occupy more than about half the bulk of the organ, the intervening pulp structure being healthy. The spleen, as a whole, is generally enlarged, though not very much so, and therefore no indication may exist externally of the disease within. In consistence the organ is hard, but not more so than is witnessed in some forms of heart disease. Even when a section is made the alteration in structure might be very readily overlooked, and no doubt often is so; but after being exposed to the air for some time, the distinction in colour between the adventitious matter and the natural splenic structure becomes very evident. These translucent bodies, as before said, are formed by the deposition of the lardaceous material in the Malpighian corpuscles, and the same product is sometimes seen surrounding the smaller arteries which pass to the latter, as well as affecting some of the fibrous trabeculæ. The material itself, both to the naked eye and to the microscope, presents the same appearance as that found in the liver.

The second form of the disease is where a peculiar translucent substance pervades the organ in all parts, giving the appearance as if a quantity of melted tallow had been poured into its cellular structure. This matter appears identical in all respects with that before mentioned; but instead of affecting the splenic corpuscles by a slow transformation, is poured out into the substance of the organ in a more ill-defined and rapid manner; whether the two, however, result from the same affection presented to us under different circumstances, or whether they are dissimilar, remains yet to be proved by more extended observation. Besides the mere outward similarity of the disease to the ordinary form, its association with tuberculosis, and with a peculiar enlargement of the lymphatic glands, sometimes found coexisting with lardaceous disease, is another reason for supposing the two are closely allied. This is seen in cases Nos. 36 and 38, which suggest the question whether this peculiar matter in the spleen, as well as the lardaceous generally, may not be closely allied to the tubercular, but assuming another form; for since we see transparent tubercle and soft strumous deposit, whose identity is generally supposed, coexisting in one organ, so is it possible that a very rapid and acute exudation of inflammatory strumous matter might assume the condition seen in the spleen, and in truth we do witness a very similar substance produced around vomicæ in phthisical lungs. One peculiarity in the case No. 38, just mentioned, is that the matter in the spleen contained a fibro-nucleated new growth; and it will be observed that, in many cases of lardaceous disease, both in the liver, kidney, and absorbent glands, this tendency to the formation of fibre was recognised.

The third form of the disease which we have to mention bears some relation to those previously spoken of; but its precise connection with them has yet to be discovered. Its tie of relationship is not only

through its own similarity of composition, but through tuberculosis and the peculiar enlargement of the lymphatic glands, which are sometimes found with lardaceous viscera. The spleen in this form is seen to be pervaded by a whitish-yellow, opaque, soft material, in distinct masses of an irregular shape, and not occupying any particular portion of the organ, or running through it in continuous lines, as in the former cases. It resembles in appearance the mixture of lardaceous material and fat, already spoken of as often seen between the lobules upon the margins of the liver. This disease has been sometimes indiscriminately called tuberculous, but the adventitious substance differs considerably from true miliary tubercle in the spleen, although it resembles very closely the soft yellow strumous material found in this organ, and with which it is possible it may be identical The great interest of the affection is its being associated with an enlargement of the lymphatic glands, producing an obscure but fatal disorder. In vol. iii. of the 1st series of the 'Guy's Hospital Reports,' under the article of "Abdominal Tumours," by Dr. Bright, this physician, while describing the various forms of disease displayed by the spleen, gives the following account of one variety which appears to be identical with that to which we refer, though he styles it malignant: "There is another form of disease which appears to be of a malignant character, though it varies from the more usual form of malignant disease, and which has been particularly pointed out by Dr. Hodgkin as connected with extreme disease of the absorbent glands, more particularly those which accompany the blood-vessels. The whole of these absorbent glands become larger and firmer, without any tendency to suppurate, as in ordinary scrofulous disease, or to soften, as in cerebriform disease; and, at the same time, the spleen becomes more or less completely infiltrated through its whole substance with a white matter, with almost the appearance of suet. This matter insinuates itself into the cellular structure of the spleen, but it is no easy matter to point out what particular portion of the structure receives it. A section of the organ seems to show, from the irregular forms assumed, that it fills a cellular structure, and, in some degree, takes its shape from the cells into which it enters; having less tendency to assume the form of regular globular masses, or tubera, than other malignant disease."

How these three forms of disease in the spleen are connected we will not at present undertake to say, but that an indirect connection exists is seen by the perusal of the above cases; where the second and third forms are both seen associated with an enlargement of the lymphatic glands and with tuberculosis, while these two latter affections are constantly combined with lardaceous disease.

Lardaceous kidney.—The lardaceous disease may occur to any amount in the kidney, associated with similar disease in other organs.

It may arise as a primary affection, and often, in its most marked form, is found in connection with phthisis. In some of these extreme examples there also appears to be a considerable development of fibrous tissue; and this was particularly the case in two specimens referred to in a paper on "Bright's Disease," in vol. viii. of this work. In such cases as these, the organ, when removed from the body, might be mistaken, at first sight, for a specimen of the large white kidney of Bright, but a little more minute examination will show the difference between them. The organ is considerably harder than the Bright's kidney, and, instead of being easily lacerable, is remarkably firm and tough; the surface is uniform and smooth, and presents no mottling or white deposit discoverable by the eye; the cortical structure is seen to be much increased in extent, and this causes the whole organ to appear as if composed of one uniform albuminous substance (except where the apices of the cones appear), giving it a semitransparent appearance, and a leathery consistence. These extreme cases are, however, seldom met with, but have been found associated with diseased bone, phthisis, or occurring as the primary disease. The more common form of the disease is a less or partial degree of it, and associated with a similar affection of the liver and kidneys, and met with, like them, in connection with necrosis of bone. The translucency, hardness, and uniformity of the surface is often sufficient to identify it, if present to any extent, but if in a less degree, the aid of the microscope is required to detect the presence of the disease. If a thin slice of the affected organ be taken, this instrument will at once discover the alteration by the peculiarity of the Malpighian corpuscles; these appearing by transmitted light as round transparent bodies, having a glistening aspect, and thus producing a resemblance to the spleen when the subject of the like disease. If the capsule be torn off, the lardaceous material will be seen surrounding and enveloping the capillary vessels composing the Malpighian tufts, and also the the smaller arteries which are going to form them. If iodine be added to such a section, the Malpighian corpuscles will be seen to imbibe the colouring matter, and appear as bright-red glistening bodies, set in the ordinary structure of the kidney.

With reference to lardaceous disease affecting other organs, there is no doubt that such occurs, and, as before mentioned, the microscope brings to light this peculiar transparent or colloid material under a variety of circumstances. Whether, however, the change in tissues which produces this lesser morbid condition is identical with that which causes the total alteration of the organ, to the destruction of the patient, as in the disease under consideration, is not yet proved. We shall therefore let the question rest for the present, and be content with having spoken of the great and marked changes occurring in the three important organs already described.—*Guy's Hospital Reports*, 1856, *p.* 103.

DISEASES OF THE URINARY ORGANS.

37.—ON THE TREATMENT OF DIABETES.

By Dr. Joseph Bell, Physician to the Royal Infirmary, Glasgow.

[In glancing over the history of diabetes, we find that only four important discoveries have been made regarding its pathology. The first was that of Willis, who, about 1674, established the existence of sugar in the urine. The second was that of Chevreul, who, in 1815, discovered the character of that sugar. The third, that of M'Gregor, who proved the existence of sugar in the stomach and blood irrespective of the character of the food, whether animal or vegetable. The fourth is that of Bernard, who discovered the organ by which this sugar is formed. The most important points which have recently been established by Bernard, are]

1. The liver secretes sugar from the blood, and this takes place independent of the character of the food, whether it consists of animal or vegetable substances.

2. The formation of sugar is not produced by a mere catalytic action, but by the separation of a portion of the blood, through the vital agency of the cells of the liver; and this separated portion undergoes further changes, which end in the formation of sugar. Therefore, the substance which immediately precedes the production of sugar does not exist in the blood, but is secreted from it by the liver.

3. The liver forms bile from the blood.

4. The liver converts the results of the digestion of saccharine and farinaceous substances, not into sugar, but into an opaque fluid of a fatty character.

5. A large portion of the sugar becomes transformed, or converted into other compounds in the lungs, not, however, by the action of oxygen alone, as Dr. Pavy alleges. Bernard found that, on exposing saccharine solutions to the action of oxygen, the sugar remained unchanged as long as when it was exposed to the action of atmospheric air or carbonic acid. But when such solutions were brought under the influence either of nitrogen or hydrogen, the sugar rapidly disappeared.

6. Derangement of the pulmonary functions affects the quantity of sugar. Whatever increases the activity of respiration, augments the amount of sugar, and *vice versa*.

7. Irritation of the brain at the bottom of the fourth ventricle produces an artificial diabetes.

8. Such production is only of a temporary character, unless congestion of the liver and digestive organs be induced.

9. A section of the spinal cord beneath the cervical enlargement interrupts the secretion of sugar by the liver.

10. A section of the spinal cord above this enlargement deranges, but does not suspend, the saccharine function of the liver.

Though these important facts completely overthrow the erroneous notions which previously prevailed, and are calculated to throw much valuable light on the pathology of diabetes, yet we have to lament the immense darkness and ignorance which still exist, and which are likely to remain unmoved during a long series of years.

How is it possible to tell whether the organ primarily affected be the liver, lungs, or brain? Even if we were able to trace the origin of the disease to the liver, how are we to determine whether sugar results from super-secretion, or from a non-conversion of the results of the saccharine and farinaceous aliments into the opaque fatty fluid? If we could resolve these difficulties, we would still have to investigate the nature of the lesion, by which the extra-secretion or non-conversion was produced. Difficulties equally formidable attend our researches regarding the important share which the lungs and brain have in the production of the disease.

Until these obscurities be removed, we dare not presume to say that we can treat diabetes on scientific principles.

[We shall now make a few general remarks on the different remedies employed.]

I. *Opium.*—This is a remedy of the highest value. The records of medicine show us that we possess no drug that has such powerful control over the disease. We must look elsewhere for an explanation of its power over diabetes. The solution, I think, we are likely to find in the discoveries of Bernard. 1st. We know that opium possesses an immense power over the function of the liver, reducing its activity. 2nd. The influence of opium over the cerebro-spinal system cannot be denied. 3d. In full doses it reduces the respiratory actions. Bernard has shown that excitation of the functions of the liver, of the lungs, or of the brain, is associated with the appearance of sugar in the urine. Opium, therefore, by its power of reducing the functional activity of these organs, claims consideration as a scientific remedy. I have only to add, that I have found it better to give one full dose at bed-time, than smaller ones at short intervals. By this plan, we cause less derangement of the digestive functions. We may also act beneficially in another way. Bernard has shown, that by severely irritating the brain substance at the bottom of the fourth ventricle, so as to induce congestion, no sugar is produced in the urine—a slight degree of irritation causing its appearance. Now, small doses of opium, by producing a stimulating effect, might even increase, or, at least, would not diminish the secretion of sugar; whilst, on the other hand, a full dose, by its congestive effects on the brain, would powerfully influence the production of sugar. I have never ordered the immense quantities prescribed by many practitioners. Dr. M'Gregor states, that some of the patients who were the subjects of his experiments, took as much as sixty grains during twenty-four hours. Such heavy doses must interfere very seriously with digestion and nutrition, and consequently

tend powerfully to debilitate the patient, especially when conjoined with restricted diet. Indeed, as I have already observed, this plan becomes a process of slow starvation, essentially assisting to hasten a fatal termination. The cases which I have detailed show, at least, that by moderate doses twice or thrice daily, or even an ordinary dose at bed-time, we can reduce the urine to a moderate quantity, and restore the strength of the patient.

II. *Ammonia and Alkaline Remedies* were in considerable reputation previous to the days of Willis, by whom they are favourably recommended. Then, and long subsequently, they were used empirically; that is, solely in consequence of the advantage which generally resulted from their employment. Of late years they have been used on other considerations; namely, the supposed acid condition of the blood, and consequent non-conversion and accumulation of sugar in the system: the idea entertained being, that ammonia and alkaline salts, by destroying the acid state of the blood, permitted the oxidation or transformation of the sugar to take place. Whilst we know that this explanation of the *modus operandi* is erroneous, yet we must admit that benefit resulted from the use of the remedies. The cases which I have narrated verify this opinion. I think that we can explain this efficacy on sufficiently plausible grounds. 1st, The action of ammonia on the liver, especially the muriate, is acknowledged by numerous writers of all countries and ages. 2nd, Bernard has demonstrated, that the action of hydrogen and nitrogen on saccharine solutions speedily effects the transformation of the sugar. Now ammonia (NH_3) may prove useful in diabetes, by destroying the superfluous sugar in the blood, and also in the cells of the liver. Animal food, from its nitrogen, may act in the same manner. In this way chemistry affords a rational explanation of the mode in which these and other remedies act. Such is the proper position of this science—not to lead the physician, but to explain to him the rationale of his experience and observation.

The preparations of soda, potass, and lime, have not been in my hands productive of any permanent benefit. A reduction in the quantity of urine follows their employment at first, but in a very short time this influence is lost, and the urine reaches to its former abnormal standard. I would explain Mialhe's success by the fact, that he always combined opiates with the alkalies.

III. *Cod-Liver Oil.*—I was led to give this remedy a trial from the following considerations:—

1. From numerous cases having been published in the British and foreign periodicals, showing very beneficial effects from its use.

2. From the very frequent association of phthisis and other forms of scrofula with diabetes.

3. From the extremely rapid disappearance of fat during an attack of the disease.

4. From the important influence which the oil exerts over nutrition.

5. From Bernard's experiments, which show that the liver exercises the function of assisting in the formation of fat from the results of the digestion of saccharine and farinaceous substances. The loss of this fat-producing function may possibly hold a very intimate relation to diabetes. The saccharine matters may pass into the blood, instead of being transformed into fat. Hence the sugar in the urine—hence the loss of fat and the emaciation, the presence of oil-globules in the blood being necessary to assimilation and nutrition. Cod-liver oil, by the ease with which it is digested—some writers, indeed, assert that it passes immediately into the general circulation, without traversing the portal system—would very effectually supply the loss.

6. Fatty matters were recommended as articles of diet by Rollo and others, as exceedingly appropriate to diabetic patients, and found to be remarkably beneficial.

From these circumstances I was induced to give the oil a trial, and from the trifling experience which I had of it in the cases quoted, I am led to entertain a very high opinion of its efficacy. I would, therefore, respectfully recommend it to the notice of the profession.

IV. *Blisters to the Hepatic Region and Nape of Neck.*—I confess these I employed in consequence of Bernard's experiments. I was the more readily induced to apply them over the liver, from the frequency with which this organ and the other abdominal viscera exhibit symptoms of congestion. I am convinced their application to the hepatic region was beneficial. I consider cupping or leeching the same part would be found advantageous, provided the strength of the patient would permit.

I cannot say that I could perceive any advantage from counter-irritation to nape of neck.

V. *Muriated Tincture of Iron—Hydrocyanic Acid.*—I have found the former useful when the patient's appetite began to fail from the continued use of opium. I conceive that it merely acts as a tonic, and possesses no specific influence. The latter I only employed in the last case, and from the short time the patient remained under observation, I am not enabled to say anything respecting its influence. I was led to employ it from the effect which it has in reducing the excitability of the medulla oblongata. I consider it worthy of a fair trial.

VI. *Diet and Regimen.*—A restricted diet was employed in some cases for a short time, in order to demonstrate to the students, that no real benefit followed the practice—that, even under the plan, the quantity of urine was only temporarily reduced, whilst the poor patients were rendered most uncomfortable from the restriction, and actually became much more enfeebled. The result of my experience is, therefore, opposed to a restricted diet. Doubtless we can reduce the amount of urine, but, simultaneous with this diminution, we reduce the flesh and strength of our patient. The cases which are contained in this paper fully confirm these statements. Again, the experiments of Bernard entirely discountenance such restrictions. I

do not understand how any physician can now continue to harass his patients by this plan of treatment, after it has been demonstrated that the sugar is formed *from* the blood, independent of the kind of food taken. It is formed when not a particle of saccharine or starchy matter is swallowed, and when the food consists entirely of animal substances. A much more plausible practice would be to feed the diabetic on farinaceous and saccharine matters, so as to prevent *the use of the blood* by the liver in its sugar-producing function. At all events, I think it must appear self-evident that the withholding of a mixed diet from the patient is an act of cruelty. It renders them miserable, at the same time diminishes their strength, and, I am afraid, often hastens their death.

VII. *Bath.*—The warm bath was ordered occasionally to the patients, merely to maintain proper cleanliness. I do not understand how we can expect much benefit from profuse perspiration. We can only reduce the watery part of the urine to a slight extent ; but the augmented specific gravity proves that we have not mitigated the disease ; nay, probably, on the other hand, the strength has been somewhat reduced by the extra loss of fluid through the skin.

Practical Summary.—From the foregoing considerations, I conceive the following conclusions are justified :—

1. Opium has a most powerful effect in diminishing the quantity of urine, but does not cure the disease.

2. Ammonia seems to possess, at least in some cases, the power of reducing the amount of urine, the specific gravity, and quantity of sugar.

3. Opium and ammonia combined have a most beneficial effect.

4. Cod-liver oil alone is beneficial,—it improves the general condition of the patient, reduces the quantity of urine, and lessens its specific gravity.

5. Cod-liver oil, combined with opium, rapidly improves the strength of the patient, and reduces the urine.

6. The combined use of cod-liver oil, opium, and ammonia, effects the most prompt and permanent benefit.

7. Blisters to the hepatic region are useful.

8. The restriction of diet is rather baneful than beneficial. A mixed generous diet is the best.

9. In the present state of our knowledge, we can only expect to improve the general condition of the patient, restrain the waste of tissues, maintain the vigour, and reduce the amount of urine. In this way we can mitigate the disease, and protract the life of the patient. We are bound to confess that we have no cure for diabetes. It is not the only disease which defies the efforts of our art. In many other affections, we can only palliate suffering and prolong existence. These objects we can very satisfactorily accomplish in diabetes. by the judicious use of cod-liver oil, opium, and ammonia.

But it may be asked, how are we to explain the instances of re-

ported cures that from time to time are published, ever and anon exciting our hope that an agent has been placed in our power by which we can secure an easy victory over the disease? My answer is two-fold, 1st, That such cases may have been of a mere temporary nature; a character under which diabetes is sometimes presented. 2ndly, That in many of the published cures, an erroneous diagnosis may have been made in consequence of the use of Moore's or Trommer's tests, both of which are deceptive, a brown precipitate being produced by the presence of other organic matters as well as by sugar. I would admit no case as genuine diabetes unless the yeast test had been employed. I do not speak from conjecture on this point; but from experience. Indeed, I fell into this very mistake some years ago, in consequence of this brown deposit. The fallacy was pointed out to me by the late Dr. M'Gregor. I have reason o suspect that in many of the cases that have been published regarding the presence of sugar in the urine of old persons, especially when labouring under disease of the lungs, the deoxidation of the copper is effected by some other organic matter, and not by sugar. I have often, in such cases, been able to produce a brown sediment, but I have always failed to effect fermentation.—*Glasgow Quarterly Journal, July*, 1856, *p.* 146.

38.—ON THE MASKED FORMS OF BRIGHT'S DISEASE.

By Dr. E. Fenger, Principal Physician to Frederiks Hospital.

(Abridged from the Hospitals-Meddelelser, Anden Række, Kjobenhavn, 1856, p. 399.)

The diseases or groups of symptoms, in which it is especially important that the attention should be directed to the possible existence of Bright's disease, either as a cause or as a complication of the affection, are chiefly the following:—

1. *Scarlatina*, when cerebral symptoms set in, either when the fever is at its height, or during the stage of desquamation, or if the fever becomes protracted, and the appetite does not return.

2. *Typhoid fever.* This disease may be simulated by Bright's disease; the latter is diagnosed chiefly by the greater violence of the pain in the loins, with tenderness of the lumbar region, by the great drowsiness, and by the absence of the characteristic exanthemata. But Bright's disease may also occur contemporaneously with real typhoid fever, which may then become very dangerous, and in every case becomes tedious, as it is long before the fever entirely disappears, or the strength returns, and the patient suffers from a particularly fretful temper.

3. *Stupor and coma*, whether it occurs suddenly, or after previous delirium or convulsions. It resembles in many respects the apoplectic stupor and coma, but is distinguished from it by the following signs, which, however, do not always hold good. The coma which depends

on Bright's disease is not combined with hemiplegia, at least the latter exists in but a very slight degree; the pupils are not immoveable; it is only in the most violent cases that the coma is uninterrupted, or if it is succeeded by lucid moments, or by delirium or convulsions, it is apt to be attended with frequent and violent movements of the extremities; the stertorous breathing has a ringing sound. The coma does not occur so suddenly as in the more violent apoplectic attacks, but is preceded by either stupor, delirium, or convulsions.

4. *Meningitis.* The symptoms which chiefly lead to a suspicion of the existence of a renal affection in the group of symptoms which most closely resemble meningitis, are: alternation between stupor and delirium, the violence of the delirium (which, however, is far from being always present), audibly moaning respiration, loud screams, trembling of the limbs, intercurrent convulsions, constant objectless movements of the extremities, suppression of urine.

5. *Epilepsy*, especially when it occurs with several attacks rapidly succeeding one another, that is, as eclampsia. In certain cases we get an idea of the origin of the epilepsy by its being preceded by a state of stupor; in others by the degree and duration of the subsequent sopor. But the most usual token is, that several attacks follow one another *coup sur coup*, and if the patient happens to be a pregnant or puerperal woman, the probability is very great that the disease is connected with Bright's disease.

6. *Amblyopia and amaurosis.* It must be borne in mind, that this affection, when it depends on Bright's disease, developes itself simultaneously, and to the same degree, in both eyes. There is no opacity of the pupils, nor any discoloration of the external parts of the eye, nor is there any symptom of organic changes in the organ; the pupils are neither very much dilated nor much contracted; the iris is rather slow in its movements, but is by no means immovable.

7. *Spasm of the glottis.* When decided symptoms of closing of the rima glottidis are present, whether these more closely resemble the symptoms of œdema of the glottis, or of proper croup, and when examination of the throat does not exhibit the changes usual in these diseases, in the visible portions of the mucous membrane, there is reason to examine whether Bright's disease may not be the source of the symptoms.

8. *Acute bronchitis, or œdema of the lung*, when it occurs suddenly, with fever, violent pains in the chest, and especially with very great dyspnœa, which excites a suspicion of the existence of an acute inflammatory affection of the thoracic organs, while sthethoscopic examination does not afford signs of more than bronchitis, or œdema of the lung.

9. *Pneumonia and pleuritis.* It may be especially suspected that these affections are connected with latent Bright's disease, when either actual dyspnœa exists, or the shortness of breath is much greater and more obstinate than should be expected from the change in the

thoracic organs demonstrable by auscultation. Complication with renal disease may also be suspected, from the slowness with which the dyspnœa and pain in the chest disappear during convalescence, the pleuritic effusion is absorbed, and the patient's strength is restored.

10. *Chronic bronchitis and phthisis.* Masked Bright's disease seems not unfrequently to exist in these affections, without, however, its being possible to point to anything peculiar in the symptoms, which may in the particular case excite a suspicion of this complication.

11. *Hypertrophy of the heart.* This is frequently present where there is Bright's disease, but seems not to impart any peculiarity to the symptoms, if, perhaps, we except a rather increased tendency to hæmoptysis, which may also show itself in the masked forms of Bright's disease, where the symptoms of cardiac affection are exceedingly weak, or altogether absent.

12. *A highly forced respiration*, by which the thorax becomes, with deep and audible inspirations, excessively filled with air, without any material change being from the first discoverable in the organs, may also indicate latent Bright's disease, which is then a very dangerous form of the same.

13. *Nausea and vomiting*, with a feeling of great depression, and most usually the rejection of a grass-green fluid, may, particularly when they last for several days, or even longer, and when there is no sign of any other abdominal affection to account for them, excite suspicion of latent Bright's disease.

14. *Chronic diarrhœa* may give an indication of the same. It is then usually mild and without pain, alternating with constipation or with the natural action of the bowels, while there is no sign of the existence of those diseases of the intestinal canal or other organs which usually occasion this symptom. In chronic diarrhœa in children, the examination of the urine should never be neglected.

15. *Cardialgia*, when it is very obstinate.

16. *Chronic enlargement of the liver and spleen*, without pain in these organs, without any knotty condition of their surface, and without jaundice, but sometimes with a slightly yellowish discoloration of the skin.

In conclusion, the author enters into an examination of Dr. George Johnson's division of Bright's disease into two principal varieties—namely, the desquamative and the non-desquamative forms. (See 'British and Foreign Medico-Chirurgical Review,' vol. xi. Jan. 1853.) The first of these derives its name from the expulsion of great masses of the epithelium lining the tubuli uriniferi, which is recognized by microscopic examination of the urine; the urine is albuminous, though much less so than in the other form: its specific gravity is much less, and its quantity is not so diminished as is most frequently the case in the second variety; usually it is even increased. On *post mortem* examination the kidneys are found to be neither swollen, nor of the soft consistence, nor of the variegated colour, mottled with yellow, which

characterizes the most ordinary cases of Bright's disease. They are, on the contrary, either of their normal size, or even less, and moreover very firm, sometimes even hard in their substance, of a more or less red, though frequently very pale red or pearl-grey colour, usually granular on the surface. Dr. Johnson attributes this disease to destruction of the tubuli uriniferi, connected with desquamation of the epithelium; the tubuli are loosened and collapse, by which an atrophied condition of the renal tissue is produced, and he has found that although dropsy sometimes certainly exists in this variety, it is not usually present, while on the other hand it is constant in the non-desquamative form, giving rise to an essential difference between the two forms. In the non-desquamative form, which is that most usually observed in the cases we comprehend under the denomination of Bright's disease, the kidneys are perceptibly enlarged, of a softer consistence, and of a dull white colour, with numerous yellow spots and dots interspersed. In this variety the quantity of urine is diminished, its specific gravity is often considerable, the amount of albumen is large, the sediment formed in the urine is slighter and more cloud-like. The microscopic examination of the urine exhibits a smaller number of cast off epithelial cells and cylindric bodies, and the latter appear to have undergone more or less of fatty degeneration. This form of disease is, according to Dr. Johnson, always attended with dropsy, and the latter is usually present, even in a great degree. In a prognostic point of view, Dr. Johnson has found the two varieties essentially different, as the non-desquamative form always affords a very bad prognosis, while he has found that the desquamative variety is often curable.

It will be seen that Dr. Johnson is here opposed to the fundamental view which has hitherto prevailed among pathological anatomists, who describe the condition in which the kidney is enlarged, flaccid in its tissue, and mottled with yellow, as the second stage of Bright's disease, and that in which it is diminished, hard, and granular, as the third stage of the same. They assume that the condition of the renal tissue which exists in the third stage, occurs by the fibrinous exudation thrown out in the second stage becoming organized and converted into a contractile tissue, which contracts and so produces an atrophied and granular state of the renal tissue, while Dr. Johnson looks upon these two states not as stages of the same disease, but as two different diseases, which it is, of course, important to distinguish.

Having alluded to the opposite opinions of Drs. Wilks and Frerichs upon this subject, and to the difficulty of establishing the distinctive marks of the two varieties assigned by Dr. Johnson, in consequence of the vicissitudes which will occur in an individual case in the quantity of the urine, its specific gravity, its amount of albumen, and in the quantity and nature of the sediment, Professor Fenger proceeds to observe, that the statement that it is only the desquamative form which is capable of passing through all its stages without dropsy, deserves a most careful examination, with a view to determine if we are at pre-

sent in a position to decide how far the kidneys of individuals, whose disease has run through its course in this manner, constantly show the anatomical changes characteristic of Johnson's desquamative form, especially the increased hardness, and the contracted condition, with more or less evident granulations; in other words, what the more recent pathological anatomists usually call the third stage of Bright's kidney. He, therefore, reviewed his own cases, in order to ascertain whether, in them, the kidneys invariably presented the changes of the so-called third stage of Bright's disease, or whether they were also sometimes found swollen, whitish yellow, mottled, &c., as in the so-called second stage. The result was strongly in favour of Dr. Johnson's statement, that when a man dies of Bright's disease, without having exhibited dropsy, his kidneys will be found hard and contracted. The exceptions to this rule are, he adds, rare, and the circumstances under which they occur, are as yet unexplained, and he considers that the opinion hitherto generally held, that the enlarged whitish yellow kidney constitutes the second stage of the disease, and the contracted hard kidney the third, is now scarcely to be entertained.

Still the author does not consider Dr. Johnson's propositions to be as yet proved in their full extent. It is not probable that two distinct diseases exist as stated; for although the dropsy is wanting in some instances, in which the kidneys are found after death to be atrophied, it may also often be present in these cases, and it will be inferred, from the entire description given by the author, that there does not occur a single symptom, in the masked forms of Bright's disease, which is not also met with in the ordinary cases of the affection. The disturbance which is produced by this disease in the functions of the system must, therefore, be the same in both forms; and the *principium morbi* must be identical in both cases.

But it does not follow from this that different anomalies of nutrition and function in the kidneys may be their original cause, and that the identity of the morbid forms is, therefore, founded, not on the renal disease being the same in both cases, but on this, that many morbid conditions of the kidneys may produce the same or similar consequences in the rest of the system. Such an explanation appears to the author to be the most probable solution of the question.—*Dublin Hosp. Gazette, Sept.* 1, 1856, *p.* 234.

39.—*Albuminuria.*—M. Mauthner in the albuminuria and dropsy after scarlatina in children, recommends the exclusive use of a milk or rice-milk diet. Under its influence, he says, an abundant urinary flux becomes established, which causes the disappearance of the dropsy; but should it not suffice for the cure, he would seek to modify the urinary secretion by the use of alkalies. He recommends urea to be given in such cases, in doses of one-third of a grain, mixed with sugar. When a dose of 6 or 8 grains is arrived at, he says, it occasions an abundant secretion of urine, and rapid disappearance of the dropsy.—*Brit. and For. Med.-Chir. Review, July*, 1856, *p.* 240.

40.—ON THE DISTINCTIVE TESTS OF SOME OF THE VARIETIES OF ALBUMEN.

The following remarks are extracted and condensed from a valuable series of chemical tables compiled by T. J. Herapath, which are being published in 'The Chemist:'—

All forms of albumen contain nitrogen and sulphur, are soluble in a hot solution of caustic potash, and then blacken the salts of lead; heated with a solution of sub-nitrate of mercury to 140 deg.—160 deg. they acquire a deep red colour.

1st. *Albumine* is coagulated by boiling, but more readily on the the addition of dilute nitric or hydrochloric acid. There are two varieties of it; the first, ovalbumine, the white of egg, is distinguished by its coagulating with ether, and by acetic acid and heat, remaining so at all temperatures; the second, or seralbumine (of blood serum), is not coagulated by ether, and the precipitate with acetic acid only appears on cooling the solution, and redissolves on the application of heat.

2nd. *Emulsin*, obtained from the kernels of almonds, and certain species of *pyrus*, is distinguished by precipitating with ordinary phosphoric acid, whereas ordinary albumen precipitates only with the metaphosphoric acid.

3rd. *Fibrine*, distinguished by its power of spontaneously coagulating.

4th. *Caseine*, or *legumine*, obtained from milk, vegetable juices, the seeds of the *leguminosæ*, &c.; it is distinguished from fibrine and albumen by its not coagulating either spontaneously or by heat, and by forming a pellicle, when its solution is evaporated. It is coagulated by dilute acids, which are unable to coagulate albumen.

5th. *Pepsin*, contained in the juices of the stomach. When digested with flesh, &c., at a temperature of 98 deg., it causes the flesh to become soluble in water. It is distinguished from albumen by its solution being precipitated by dilute acids, the precipitate redissolving in excess; and from caseine, by its acid solution not being precipitated by prussiate of potash.

6th. *Hæmatosine*. Its aqueous solution is brownish, and on boiling it deposits a brown sediment, readily dissolving in alkaline solutions with a brown colour.—*Dublin Hospital Gazette, July* 1, 1856, *p.* 169.

SURGERY.

AFFECTIONS OF THE BONES AND JOINTS, &c.

41.—ON THE FORMS OF LOCAL INJURIES JUSTIFYING THE AMPUTATION OF A LIMB.

By F. C. Skey, Esq., F.R.S., Surgeon to St. Bartholomew's Hospital.

[The question of amputation is one of a very serious nature; it involves the permanent mutilation of the body—it demands the most deliberate judgment and the broadest and soundest views of the vital forces. Mr. Skey says—]

I am persuaded that in proportion as we study disease, and make ourselves familiar with the curative resources of Nature, the greater will be our faith in her power of reparation, and in her desire to exercise it.

Men adopt different views of the power of the curative art. With some it holds the relation of a *vicegerent;* with others, of a *handmaid.* Our minds are not universally impressed by the conviction, that Nature cures diseases, and not we; and that the province of the surgeon, beyond which he cannot step one foot, consists in removing obstacles in her path. If this wholesome fact were impressed more deeply on the professional mind, would it not instinctively lead to a closer observation, and of necessity to a higher appreciation of her powers? At a period as late as a half a century back, amputations were at least three times more frequent than at present. Why are they now less frequent? Not because severe injuries are wanting, or that diseases have proved universally tractable, but because by the study of physiology we have become, comparatively speaking, familiar with the power which Nature wields, and by the observation of the greater resources of the body than were known to our grandfathers.

It would be well for the cause both of humanity and of science, if it were possible to draw a definite line, which should determine the confines of reparative power; but it is the very impossibility of doing so which appears in some measure to justify so wide a range in the practice of different surgeons. That there is a line, obscure to our senses though it be, will hardly be disputed by any one who has deemed the fact worthy of remark, how common is the resort to the knife in some districts compared with that of others. And the diffi-

culty of decision is unquestionable, such is the complication of the requisite inquiry. Notwithstanding which, some approach may be attempted to a more general rule, founded on the nature and extent of the injury, than has hitherto guided the hospital surgeon in his decision, although the question of local injury will be subject to large modifications, founded on that of age, sex, the character, and condition of constitution of the affected person.

These examples may be divided into—first, such as *require* amputation; secondly, such as *justify* amputation; and, thirdly, such as neither *require* nor *justify* amputation. One word on the definition of the term "*justify* amputation." To justify may be not to give the reality, but the appearance only, of justice; to obtain the sanction of the world. A man may obtain the warrant of general opinion while he fails to possess his own. He may be safe from comment or criticism, while he is amenable to denunciation *in foro conscientiæ*. By the term "justify," I mean that warrant in favour of the removal of a limb which is obtained from the consideration of an injury placed on the confines of necessity, especially if occurring in early life, in advanced age, or in impaired constitutions.

Of the structures entering into the composition of a limb, one and all of which are the subject of rupture or disorganization, the first importance perhaps justly attaches to the arterial system; but as universal experience teaches us that the channel of the main artery may be suddenly obliterated without danger to the vitality of the limb, so in the rupture of the main arterial trunk, evidenced by the pulseless condition of the limb below, the injury is, *per se*, no warrant for amputation. But if, superadded to the rupture of the main artery, the muscular system at the seat of injury is largely contused or ruptured, and the collateral channels for arterial as well as venous blood are involved in the injury, it is more than probable that the limb will quickly fail in nourishment, the indication of which is obtained from the loss of temperature. This loss, if complete, will become apparent in the course of an hour or two. But the loss is rarely complete, and several hours, or even a day, may be required to determine the affirmative of the mischief done, on this evidence. But it is all-important evidence, and fully justifies the postponement of the decision.

Next in importance to arteries, and in close relation to them, stands the nervous system; and in reference to injury to the chief nerve or nerves the same remark will almost apply. We do not amputate the leg because the sciatic nerve is rent asunder. The true principles of surgery would dictate a pause—a period for watching and observation. But as the rupture, whether of artery or nerve, is commonly a matter of uncertainty, we can only judge by consequences, and for these we should wait.

To justify amputation, from rupture or laceration of the muscular system of a limb, the injury must be very great, because the constitu-

tion does not sustain a shock in proportion to the extent of the injured surface, supposing the integuments to remain unbroken: but if the muscles be largely torn, and the investing integuments detached, and not susceptible of entire, or nearly entire replacement, I confess such an injury would justify a doubt as to the power of Nature to restore the parts to health. I speak of very large laceration, with contusion of muscle, coupled with separation of integument and extravasation of blood.

I do not concur with many surgeons, who deem exposure of the cavity of a joint an important element of failure. I am quite aware that it is so generally deemed, and I recall to my recollection the early part of my own professional life, when a compound dislocation of a joint alone was deemed a warrant for the amputation of a limb. But I can bear witness to many cases of recovery as regards the limb, and a few of recovery to the joint itself.

Undue importance appears to me to be attached also to fracture into a joint, as though such fracture, in reference to the retention of a useful limb, raised a serious obstacle to recovery. That it places the joint in jeopardy I readily allow, but I do not believe that the advocate for amputation in any given case can derive from its presence an argument of great force, although I do not deny that it should always be considered an aggravation of the mischief done. The same remarks will apply to fracture of the bone, especially if comminuted, when superadded to the larger injury of rupture of the main artery, or of the main nerve, extensive rupture of muscles, or laceration and disorganization of the integuments.

I have never yet observed much advantage to accrue to the patient from the introduction of the finger through an opening in the skin, which is employed as an explorer, and carried round in all directions, for the purpose of ascertaining the nature and extent of the injury done. I have never, myself, acquired much knowledge by this process, which could be rendered available to the service of the patient, nor have I known it to be obtained by others. To the patient himself, so far as he is entitled to an opinion, it has always appeared to be positively objectionable. To be sure, it gratifies curiosity, though at some expense of suffering.

Finally, in all doubtful cases, I would give the benefit of the doubt to the patient, and endeavour to restore the limb. If, consequent on a large injury to the leg or thigh, upper arm or forearm, the foot or hand loose their natural warmth, amputation is the only resource. If we find extensive laceration of muscles, with extensive separation of integument, and especially if the integument be disorganized and insusceptible of replacement, I fear we must amputate, even without waiting for the above evidence of loss of vitality in the extremity; but, in a subject moderately healthy, I do not consider that any degree of comminution of bone or laceration of muscles, unless very extensive, any fracture into a joint, or compound dislocation of a joint, can

justify the abandonment of the case, so long as the structures are capable of some general replacement, and the patient can submit without suffering to the restraint necessary to his recovery.—*Lancet, October* 11, 1856, *p.* 402.

42.—*Wounds into Joints.*—[In commenting upon a series of cases it is found that where the joint is freely laid open with fracture, requiring the removal of the articular extremities, there is not so much danger as when there is a simple fracture (say of the olecranon), with a small wound of the skin.]

In all the cases which we have mentioned in which the joint had been freely laid open, and the articular ends of the bones been taken away at the time, not only were the constitutional symptoms much more slight, but the patients had afterwards good motion in the joint. In not one of those on the contrary, in which distinctive inflammation of the joint ensued upon a slighter form of injury, did any material amount of mobility remain. To excise the joint because a compound fracture of the olecranon had been sustained, would of course not be warrantable. It is very possible, not to say probable, that the wound may heal, and the bone unite without the occurrence of articular inflammation. With such facts before us, however, as have just been detailed, the question does seem worthy of serious consideration, whether after acute inflammation has already set in, as the consequence of injury, and the destruction of the joint seems inevitable, it would not be good practice to at once excise the ends of the bones; with the double hope of saving the patient's constitution, and of gaining him a mobile joint.—*Medical Times and Gazette, July* 19, 1856, *p.* 62.

43.—CASE OF EXCISION OF THE KNEE JOINT.

By G. M. Jones, Esq., Jersey.

[The following case was one which appeared very unfavourable for this operation, but which, nevertheless, terminated very successfully. There was extensive caries of the left tibia; also of the upper third of the fibula, with dislocation of the heads of both bones backwards, but as life is no more endangered after excision than by amputation, and the reparative powers of nature are so extraordinary, particularly at an early age, it was determined to test them. It is very much to be regretted that there still exists such prejudice against excision of the knee-joint, and that some of the first surgeons, men whose names will live as long as surgery is regarded as a science, rank among its greatest opponents; but on the other hand, equally bright ornaments of our profession, whose names will grace some of the most glorious pages in the annals of Conservative Surgery, uphold this operation and from experience we are assured that it may safely be adopted in many cases which seem to offer but little encouragement to success.]

Elizabeth Noel, aged 9, was admitted August 16th, 1855; but little of her previous history can be collected. It would appear that for nearly two years she had been unable to walk without crutches; that poultices of various kinds, but mostly composed of herbs, were applied to her knee and leg at some small village on the coast of Brittany, where she had resided for some years, and that, in consequence of her helplessness and increasing bad health, she was sent to this, her native place, for parochial relief, but more especially to have the affected limb removed. The child's appearance indicated a strumous diathesis; there was considerable emaciation; her appetite was very indifferent: pulse 106; nights sleepless; and the glands of the neck were enlarged. The affected leg and knee presented an extraordinary appearance, of which some idea may be formed from the following drawing copied from a photograph taken the day before the operation. The tibia was dislo-

Before the Operation.

cated backwards, its head being thrust completely into the ham; the popliteal vessels were thus rendered easily perceptible; the patella, which rested in the interspace between the condyles of the femur and head of the tibia, was so atrophied as to be scarcely distinguishable; the head of the tibia was much expanded, also the whole shaft of the bone generally, and the integuments were in a state of *gonflement;* an open suppurating surface existed along its entire length, the bone being exposed in many parts, and distinguishable by the probe everywhere; several fistulous apertures existed laterally and posteriorly, three also along the fibula on its outer aspect; the probe detected bone in all of them. There existed an immense amount of lateral motion in the dislocated joint; the muscles of the thigh were much atrophied; the motions of the ankle-joint were natural. Four days after the child's admission, the following operation was performed while the patient was under the influence of chloroform.

An incision beginning just below the patella was carried downwards along the almost entire length of the tibia. It was made in rather a zigzag manner, in order to include as many of the fistulous openings as possible; the integuments were then dissected on either side of the bones, so as to expose the diseased parts thoroughly. In many places the tibia was found divested of its periosteum, in others it was thickened and rough; while at its upper and lower thirds it was so softened

as to necessitate scooping out to a considerable depth before healthy cancellous structure was met with; the gouge and chisel had therefore to be freely employed throughout.* After removing as much diseased bone as could be seen, the next step was excision of the knee-joint. This was performed, first by making a horse-shoe flap, and then proceeding in the manner generally followed, though the extremely disorganized state of the joint rendered the removal of those parts which compose it much more difficult than is ordinarily the case.† A large portion of the joint-ends had to be removed; likewise the head of the fibula, and a large sequestrum from the upper third of this bone. The patella, after gouging its under part, was left. No vessel required ligature, though the hemorrhage was at times rather considerable.

State of the Joint.—On opening the joint, extensive pulpy degeneration of the synovial membrane was met with; the cartilages covering the ends of the bones presented unmistakeable traces of former disease; the semilunar cartilages were partially absorbed, the remaining portions disorganized; the anterior crucial ligament gone, the posterior one much absorbed, and consequently thinner than usual; the tissues generally sound, The joint was tolerably healthy.

After the operation the leg was placed in a suitable box, and kept steady by means of pads, &c. Water-dressing applied; neither sutures nor adhesive straps were employed.

It would be a work of supererogation, and tend to no practical purpose, to give anything like a daily account of the progress of this case from the time of the operation to the period of cure: suffice it to say, that everything progressed most favourably, and never for a moment did a single symptom occur to cause the slightest anxiety. At the expiration of ten days there was an evident melioration in the little patient's health; five weeks after the operation she was able to raise the whole limb; and three weeks after this, went about the wards on crutches; scarcely three months elapsed when she moved about without any appliances to the knee. The affection of the tibia and fibula did not keep pace with that of the joint; the healing process was much more gradual, owing to occasional sequestra coming away, which naturally kept up some irritation and discharge. For some time past, the child has been in perfect health, strong and stout, and can walk quickly about with her little companions. Water-dressings, with the

* For some years I have not operated on joints or bones without having near me several of the tools employed by wood-carvers, and can highly recommend their utility in some cases. Those who have watched carvers at their work must have observed how admirably adapted are some of their tools for taking away some portions without injuring those they are anxious to preserve; so their occasional use in surgical operations prevents the unnecessary dividing of soft parts, and are often of far greater utility than those made for surgical purposes.

† This difficulty would have been greatly increased had I not been in possession of the valuable saw given me by the inventor, my esteemed friend, Mr. Butcher of Dublin, to whose unwearied exertions in the cause of Conservative Surgery—which cause his great talents so eminently qualify him to advance, I am happy to have this opportunity of bearing my humble testimony.

exception of the occasional use of the dilute nitric acid lotion, were the only local applications employed throughout. The most nutritious food, and an abundant quantity of wine and malt liquor was taken; also quinine, syrup of iodide of iron, and cod-liver oil. The child, as I have already stated, walks well. Cicatrices have replaced running sores; and, as will be seen by the accompanying sketch, the limb has almost resumed its natural appearance.—*Med. Times and Gazette, June* 21, 1856, *p.* 623.

After the Operation.

44.—ON AMPUTATION AT THE KNEE-JOINT.

By Dr. Markoe, New York.

[Dr. Markoe has advocated this operation in preference to amputation of the thigh since 1841. He has watched the progress of fourteen cases, which have occurred in American practice. The following is an epitome of the conclusions he arrives at:—]

1. The grand advantage of this operation is the useful character of the stump that results, strongly contrasting with the uselessness of the stump left after amputation of the thigh, and enabling the patients to wear an artificial limb with comfort and advantage. 2. The seat of operation is farther removed from the trunk, and the constitutional shock is probably therefore less. 3. The section at the knee-joint is less extensive than that of amputation higher up, no parts being divided but the integuments, and, although a large surface is exposed, a great portion of it, the femoral cartilage, is a healthy, not a wounded surface. 4. No muscular interspaces are exposed by the knife, excepting those of the heads of the gastrocnemius, which are of small extent and depth. There is, therefore, less chance of any inflammation that may attack the stump travelling upwards, and forming burrowing abscesses, amidst the soft areolar tissue filling such interspaces. The section of tendons that takes place in this operation, is rarely followed by any other than reparative inflammation. 5. Fewer ligatures are required, and the orifices of the divided arteries lie close together in the centre of the popliteal space. By following Blandin's procedure, therefore, of "making a small opening through the integument, of which alone the posterior flap consists, we are enabled to bring all the threads out of the stump by a short and

direct route, in the most depending position ; and thus the space between the flaps and condyles, where we are most anxious to procure adhesive inflammation, is not fretted into suppuration by the presence of the ligatures crossing it, to be brought out between the lips of the wound." 6. The muscular attachments concerned in the movements of the limb are not divided. Those which are severed are merely for the movements of the leg, all the muscles proper to the thigh being left untouched. The result is, that the patient is able to move the stump with astonishing freedom and facility. 7. Another advantage directly resulting from this is, that there is no muscular retraction after the healing of the wound. "My own experience would lead me to think that, in all cases where divided muscles are united over the end of a bone, as in flap amputation through the thigh, the ultimate result is a complete disappearance by combined absorption and retraction of the muscular tissue, which, on the first healing of the wound, gave a thick and promising covering to the end of the bone. If I be not mistaken, it will be found, if the limbs be examined a year after they are healed, that the conical stump above described is the rule and not the exception, and that in four cases out of five, nothing but cicatricial tissue covers and protects the end of the bone. In the stump left by the exarticulation of the knee we have, it is true, nothing but integument on the face of the stump, but that integument is applied over a large, smooth, natural surface, well adapted to receive and sustain pressure, while the cicatrix, if the operation be properly performed, is thrown backwards in such a manner as to be entirely protected from pressure, in the deep fossa between the projection of the condyles." 8. In this operation the bone is uninjured, while in the other it is divided with a degree of violence, the effects of which are not always appreciated. "The effects of this violence, both upon the bone and its envelopes, and of the exposure of the cavity of the medullary membrane to the action of air and pus, are seen in several of the accidents which occur after amputation, some of which are merely of sufficient gravity to annoy the patient, and prolong the period of his cure ; while others are of such danger and severity as materially to endanger life." Among the accidents that may occur are the exfoliation of a ring of the injured bone, and the formation of tubular sequestra. The production of the latter the author regards as due to the division of the nutritious arteries of the bone either by the saw or the catlin. The supply of blood to the medullary membrane thus cut off is too slowly supplied by anastomosis, and the bone dies. Phlebitis is another destructive consequence of such violence, but is of much rarer occurrence in the well-ventilated hospitals of the United States than in Europe.

In reply to the objections which have been urged against the operation, on the score of exposing so large a surface, Dr. Markoe replies, that experience has shown that violent inflammation and suppuration are rare, in comparison with their production in ordinary wounds of

this joint. The danger of wounds of this part arises (1) from the extent of the synovial membrane; (2) the constant motion of the inflamed surfaces on one another; and (3) the closed condition of the inflamed parts leading to tension. The section of the joint diminishes the first of these sources of danger, and entirely obviates the two last.

In drawing the comparison of the results of this operation and that of amputation of the thigh, the author states that, according to Dr. S. Smith's *résume* of cases occurring in European practice, of 28 cases of amputation at the knee, 12 died, and 16 recovered. There have been 18 American cases, with 13 recoveries, and 5 deaths; making in all 46 cases, and 17 deaths. The proportion of deaths in European practice has been, therefore, 43, in American 28, and in the two together, 37 per cent. Of the 987 cases of amputation of the thigh, collected by Phillips, 435 died; and in 68 American cases, collected by Dr. Markoe, there were 29 deaths; being an average mortality of about 43½ per cent., and making a difference of 6½ per cent. in favour of amputation at the knee-joint.

"Of the different modes which have been proposed of performing the operation, I give a very decided preference to that by the long anterior and short posterior flap. This has the advantage of throwing the wound on the most depending aspect of the stump, allowing easy exit to the discharges; and it, moreover, brings the cicatrix so far back between the condyles, that it is not exposed to pressure. By cutting short the gastrocnemius muscles, it diminishes the number, and concentrates the situation of the ligatures, so that they can be brought through the posterior flap directly, without traversing the face of the stump. It will, however, often happen that the mode of operation will be determined by the condition of the integuments; and it is therefore fortunate that the success or failure of the case does not essentially depend upon the particular method adopted. In all cases it must be borne in mind that a great deal more flap is required to cover the ends of the condyles, than to cover a bone sawed through its shaft; and the most common mistake in performing the operation has been the not making the allowance for this circumstance, and, consequently, cutting the flaps too short."—*New York Journal of Medicine.—Medical Times and Gazette, July* 12, 1856, *p.* 43.

45.—ON AMPUTATION THROUGH THE KNEE-JOINT.

By Dr. George H. B. Macleod, Surgeon to the Civil Hospital at Smyrna.

[The French have recourse to this mode of operating only in those cases in which the head of the bones of the leg are fractured into the articulation, but in which the injury has not extended to the femur. In many cases which occurred in the English army, the operation performed was not strictly through the knee-joint, but the low amputa-

tion recommended by Mr. Syme in disease of the articulation. The practical advantages of this are such as would seem to recommend its more general adoption in any future campaign.]

The obtaining of a longer and firmer stump, and one to which a false limb can be more easily attached, than when amputation in the continuity of the bone has been performed, is in itself no small advantage, presented by this operation. Few now participate in Liston's opinion of a long thigh stump. The rectus, with its point of insertion remaining entire, is a matter of vast importance to the power of progression. The non-interference with the medullary canal obviates many of the dangers of amputation, according to Cruveilhier; while the extremity of the femur, which is largely supplied with blood-vessels, being retained, there is less risk of exfoliation than when the dense substance of the bone has been opened by the saw. There is little fear but that the flaps will adhere over the cartilaginous extremity of the bone. It is much to be regretted, then, that the operation has not been more largely tried during the war than it has been, when so many cases fitted for it have presented themselves. Two-thirds of the cases recorded by Chelius recovered; and, in the French ambulances, it is reported to have been at least as successful as amputation of the lower third of the thigh. When much of the end of the femur has to be removed, as it was in several of the cases operated on in our hospitals, many of the advantages secured by the correct operation are, of course, lost. Bauden's operation has been that followed by the French; while in five cases, operated on in this hospital, that method was modified, in so far as that the posterior flap was made from within outwards, in place of the reverse, as practised by that distinguished surgeon, and the anterior flap, too, was not made quite so long. Of the five cases which occurred in this hospital, one died on the forty-third day of phagedenic sloughing; another, a soldier of the 62nd, died on the sixty-seventh day of enteritis, the stump being healed to a point; a third sank on the ninth day after operation, of exhaustion; a fourth, who was a Russian, never fairly recovered from the shock, and died very soon; while the fifth and last case completely recovered. The successful case was operated on by Dr. George Scott, civil surgeon. The patient, a soldier in the Buffs, was struck by a ball on the right knee-joint, when inside of the Redan, on the 8th of September. He thought himself very slightly injured, as the only thing he observed wrong with the joint was his inability to flex it, on account of "something catching in it." A small opening was found in the middle of the popliteal space, slightly external to the middle line, from which a good deal of blood flowed. This opening was found to lead into the cavity of the articulation, and spiculæ of bone were felt within. A part of the end of the femur was removed, but the patella left. A round ball had, it was found, pierced the external condyle and lodged. The posterior flap eventually sloughed and exposed the end of the femur, but the bone became subsequently covered, once with

granulations, and though the patient's progress towards recovery was much impeded by the formation of an abscess among the muscles of the thigh, which required extensive incisions, he went to England in perfect health in January. His stump was strong and firm, and over its movements he had much power. The patella could be felt on the upper surface, to which position it had been gradually retracted. In several of the cases which I have seen in the French hospitals, where sloughing of the flaps had taken place and exposed the extremity of the femur, the cartilages were alone thrown off, but not a scale of bone.

Of the many ways of performing this operation, which have been proposed and practised, none appear so good as the old one of Hain; it seems to fulfil more of the "desirabilities" than any other. If cases were selected for the performance of the operation, in which the femur remaining intact, and the leg bones being destroyed, a sufficiency of flap could be got from the calf, and if the amputation was performed early, I firmly believe, with Malgaigne, that it is "Encore une de ces operations trop légèrement condamnées, et qui lorsq'on a le choix mérite toute préférénce sur l'amputation de la cuisse dans la continuité."—*Edin. Med. Journal*, *July* 1856, *p.* 37.

46.—ON SEVERE INJURIES OF THE ELBOW-JOINT.

By Jonathan Hutchinson, Esq.

[Sir Astley Cooper remarks of compound fracture of the elbow-joint, that, "In the most severe accidents of this kind, the constitution is generally able to support the injury if it be judiciously treated." Mr. Alcock remarks of excisions, that "they have been performed with good success in cases of disease, and are still more applicable to injuries." From a number of cases which have lately occurred in the London Hospital practice (reported in the 'Medical Times and Gazette,' July 12, 1856), we may draw the following conclusions:]—

1. That primary amputation on account of compound fractures of the elbow ought never to be thought of unless, indeed, either the artery be torn through, or the soft parts in front as well as behind the joint hopelessly damaged.

2. That the preceding rule requires little if any modification on account of the age, health, or previous habits of the patient. In case No. 6 of our series the man was upwards of 64, and in one given by Sir Astley Cooper the patient was a gentleman of 74, and of feeble constitution; yet in both these the result was most excellent. In case 5 the patient was a cachectic, ill-fed boy of 14. In case 11 the subject was a brewer's drayman of most intemperate habits; and one of the most favourable of those given by Sir Astley Cooper occurred in a similar character.

3. That the ill consequences to be feared are in inverse rather than

direct proportion to the amount of external injury (laceration) inflicted; those cases being most serious in which the joint is crushed with but a very small opening in the skin.

4. That in all cases, sufficiently severe to warrant it, it is far better surgery to freely enlarge the wounds behind the joint, and excise the projecting ends of the bones, than to be content with a simple reduction. Much less of suppuration, and of constitutional disturbance appears to follow cases so treated, and the chance of good motion being obtained after an excision is infinitely greater than it is when the ends of the injured bones remain. (It may be worth a question whether, even in certain cases not usually deemed sufficiently severe to warrant it, for the reasons above-mentioned, it might not be well, to enlarge the wound and excise the joint. Crushed elbows with but small external wound, undoubtedly, as a rule, do badly. The excision of joints during the acute or commencing stages of inflammation, would seem hitherto to have been regarded with suspicion, though probably with no very definite reason. In cases of slight injuries, in which at the time it had been thought best to do nothing, but which have subsequently gone wrong, it might, perhaps, be good practice, to do *secondary* excisions, say within the first week or two. The immediate relief afforded by free incisions under such circumstances is wellknown, and it would probably be increased by the removal of the bones and their ulcerating cartilages.

5. That, in the treatment of these injuries, poultices and warm fomentations should be utterly eschewed.

6. That, when it has been decided to preserve the arm, it is the surgeon's duty (excepting, perhaps, in case of sloughing) to persevere, in spite of discouraging circumstances afterwards. None of the patients in our list appear to have died directly from the effects of the injury; and in the three cases which did end fatally, the event was due to a state (pyæmia) which amputation would have availed nothing to prevent. In several, on the contrary, recovery took place from a condition apparently of but little hope; and, in one or two, the patient's own obstinacy in refusing amputation saved him his limb. Buffon described the genius necessary for the successful pursuit of natural history as consisting mainly in "*une assez grande aptitude de patience*;" and, assuredly, the quality is one no less necessary to the conservative surgeon.—*Medical Times and Gazette, July* 12, 1856, *p* 38.

47.—*New Operation in Surgery.—Disarticulation of the Scapula.*—The entire scapula, with its processes and glenoid cavity, were removed, in the Royal Infirmary of Edinburgh, on the 1st instant, by Mr. Syme, on account of a cystic-sarcomatous tumour. The patient, an elderly female, is doing well, and the arm promises to be wonderfully little diminished in usefulness through the absence of the shoulder-blade.—*Lancet, Oct.* 11, 1856, *p.* 420.

48.—CASE OF EXCISION OF THE OS CALCIS.

By R. W. Coe, Esq., Surgeon to the Bristol General Hospital.

[Wm. Senyer, aged 34 years, states that three years ago he had a fall and injured his ankle; in a few months an abscess formed on the dorsum of the foot, which, after some time, healed, but broke out and healed again repeatedly. He has not been able to move excepting with crutches since the accident, and has repeatedly been advised by different medical men to have the foot removed. On examination the soft tissues about the heel were found very much swollen. There were the openings of two sinuses, one under the outer ankle, and the other near the tendo Achillis, which both led to dead bone in the os calcis. The ankle-joint was free from any serious lesion. Removal of the calcaneum was recommended, and was submitted to on August 22nd, 1854. On September 17th he was discharged cured; in twelve weeks he could walk with only the aid of an ordinary walking-stick, and in eighteen months after the operation he could walk ten miles a-day without any inconvenience.]

The following is an account of the operation, with an enumeration of those anatomical points which determined the course adopted:—

A line carried backwards on the dorsum of the foot, from the centre of the third toe, will exactly pass over the junction of the astragalus and calcaneum anteriorly. At a finger's breadth behind the projection of the posterior extremity of the fifth metatarsal bone is the calcaneo-cuboid joint. If a line be drawn from this point upon the dorsum of the foot, so that it fall somewhat obliquely across the first line, making an angle of 75° with it, this line will exactly correspond with the direction of the calcaneo-cuboid joint in this situation. The first incision should be begun at the point of intersection of the two lines, which will be just where the calcaneum, astragalus, scaphoid, and cuboid bones meet; then it should be carried outwards across the dorsum of the foot, in the direction of the second line, over the outer edge of the foot, a finger's breadth behind the projection of the fifth metatarsal bone, and directly inwards across the sole of the foot, as far as a line carried back from the centre of the fourth toe. By taking care not to prolong the cut beyond this point, in all probability the external plantar nerve and artery will escape injury.

The second incision is begun where the first was terminated, and is carried backwards, nearly at right angles to it, through the prominent part of the outer side of the heel, inclining the incision upwards and slightly inwards towards its termination, so as to reach the inner side of the tendo Achillis an inch above its insertion into the os calcis.

The first incision should only pass through the skin, to avoid wounding the peroneal tendons; whilst, in making the second, the knife should be plunged right down to the bone, and kept in contact with it until the cut is nearly completed.

A flap will thus be formed of three unequal sides, the lower edge

being the longest, the anterior one the next in length, the posterior being the shortest. After dissecting down and exposing the peroneal tendons, the flap beginning at its anterior inferior angle should be turned up as far as the level of the inferior extremity of the external malleolus, keeping the knife close to the bone, except where it is crossed by the peroneal tendons, which must be left lying on it. Then, after dividing the tendo Achillis, and freeing the bone on its under and internal surface as far as possible, the knife should be entered in the hollow in front between the calcaneum and astragalus, immediately above the greater tuberosity of the former, and thrust deeply backwards between the two bones, so as to divide the strong interosseous ligament between them.

The calcaneo-cuboid joint, which exactly corrrsponds to the first incision, should now be laid open, and the knife passed vertically downwards between the os calcis and astragalus anteriorly. The calcaneo-astragaloid joint must then be opened by passing the knife horizontally inwards behind the peroneal tendons, just at the level of the point of the external malleolus, taking care to avoid injuring the tendon of the flexor longus pollicis muscle.

The bone will now be found to be pretty moveable, and only retained in position by the parts in connexion with its internal tuberosity, viz., the capsular ligament of the internal astragalo-calcaneal joint, some fibres of the internal lateral ligament of the ankle-joint, and the tendons, artery, and nerve which pass under the inner malleolus.

The real difficulty of the operation now commences ; for the parts are so deep in the wound as to be barely felt, and cannot be seen, from the bone being in the way. It is at this stage that the posterior tibial artery and nerve are in danger of being wounded. However, by keeping the knife close to the bone, and carefully guarding it with the point of the finger, the tendons, artery, and nerve can be separate-from the groove under the inner ankle without injury, and the fibres of the internal lateral ligament cut through ; yet to do it successd fully requires a perfect knowledge of the anatomy of the parts, and the power of recognising the anatomical details by the touch.

I have described thus minutely the steps of the dissection I employ in removing this bone, because I consider it of the greatest importance, as regards the future well-being of the patient, that there should be no violent tearing away, and no using one of the sound bones as a fulcrum for the purpose of prizing out the diseased one; for by so doing it is more than probable that some morbid action will be set up in one or more of the remaining bones, even though quite sound before the operation. These remarks are more especially applicable to removal of any of the tarsal or carpal bones. An excision of either of them should be a simple dissection, and not any more traction should be made upon the bone than can be exercised by the fingers, and then only for the purpose of ascertaining at what points the bone is fixed to the surrounding parts.

Although we know that perfect and strong union takes place between the cut ends of tendons, yet there is a great advantage in not cutting them in this particular operation, on account of the great difficulty there would be in ensuring apposition of the ends if they were divided, and so of restoring the proper function of the attached muscles; and it is of infinite importance to the patient that he should retain the power of raising himself on his toes, flexing them, and extending his foot, all of which he can do if the tendons be left intact.—*Asso. Med. Journal, May* 10, 1856, *p.* 375.

49.—*Reduction of a Dislocated Femur by Manipulation only. Three Weeks after the accident.* By THOMAS WORMALD, Esq., St. Bartholomew's Hospital.—[This case is a good illustration of the efficiency of the manipular method in reducing dislocations of the femur. A strong, tall, muscular man, aged 44, walked from his own home, a distance of a mile, to see Mr. Wormald. He states that three weeks before he fell about 15 feet, and had been lame in his hip ever since. He laid in bed 10 or 11 days after the accident, and since then had been going about. Mr. Wormald immediately detected dislocation into the thyroid foramen.]

On the following day (the 25th after the accident.) reduction was effected in the following manner. The patient, under the influence of chloroform, was laid on his back on a table, a towel for counter-extension being passed round the inside of the hip. The operator then standing in front of the patient, placed the front of the knee of the affected limb in his own axilla, passing his right arm under the thigh from within outwards. With the left hand he then grasped firmly the upper part of the displaced bone, at the same time taking his left wrist in his right hand. In this manner, the thigh was firmly held, easily managed, and great force in rotating it and directing its movements could be applied. Mr. Wormald now bending the thigh on the pelvis accomplished a rotatory movement outwards. The first few attempts had the effect only of breaking down adhesions, and loosening the bone. Complete reduction was, however, after a short time (about 10 minutes) effected, the slipping of the head of bone into its socket being attended by a snap distinctly felt by the operator. The symmetry of the two sides was perfectly restored.

In commenting on this case, Mr. Wormald mentioned one treated by himself some years ago, in which, after a failure in the attempt to reduce by pulleys, he succeeded by the plan just described. The patient was a very muscular man, aged 22, and the bone had been out of place six weeks. The dislocation had originally been on to the ilium, but in the attempt with pulleys, the head of the bone had been thrown into the ischiatic notch, from which all the force that could be applied

by them had failed to remove it.—*Med. Times and Gazette, August* 16, 1856, *p.* 170.

50.—*Diagnosis of Dislocations of the Femur.*—In the case above given, Mr. Wormald pointed out to the students present a sign of dislocation of which no mention is, we believe, made in books. On looking at the limb from the side, the front outline of the thigh (the belly of the rectus) was seen to present a concavity instead of the curved prominence natural to it. The explanation was of course easy, in the circumstance that the bone was thrown backwards, carrying with it the muscles of the thigh.

In a case which occurred some few months ago under his care in Guy's, Mr. Hilton drew attention to a condition which was extremely well marked, respecting which he observed, that although rarely attended to, he believed it to be one of the most useful diagnostic signs in difficult cases. It consisted in the loss of support from behind to the vessels. On pressing the finger on the latter the existence of a hollow behind them, and the deficiency of that firm support which they naturally possess was most readily appreciated. This sign would be of great value in those cases in which the difficulty in diagnosis lay between dislocation of the bone and fracture of its neck or shaft high up.

We are anxious to draw attention to the above observations, because everything is of importance which tends to render more certain the diagnosis of these dislocations. Few things are more damaging to a surgeon's reputation than to have made a mistake in the opinion he has given as to the nature of a case of this kind. Yet although, under certain rare combinations of circumstances, the detection of a dislocation of the hip must be admitted to be a matter of great difficulty, we cannot but think that in the majority of the cases in which mistakes occur, the fault is rather in a careless examination than either in absolute want of knowledge on the part of the surgeon, or real obscurity of the symptoms. To strip the patient, to expose both the sound and the injured side, to try the motions of the joint in different positions, standing as well as lying, these are precautions which, if observed with care, we can scarcely think would allow of the committal of error. It may be, from swelling having already occurred, that the prominences of the part have been concealed, and so much tension and tenderness produced that the patient will not permit the necessary manipulation. Under these circumstances we cannot but think that it would be much better at once to put the patient under chloroform, and make a satisfactory examination, than to wait in uncertainty till the swelling has subsided. Not only would the use of anæsthetics under such circumstances facilitate diagnosis, it would greatly aid treatment. The reduction of either a dislocation or a fracture would be much more easy during the relaxed state of the muscles thus produced than while the patient was conscious.—*Med. Times and Gazette, Aug.* 16, 1856, *p.* 170.

51.—OLD STANDING DISLOCATION OF THE HUMERUS: NEW MODE OF REDUCTION.

By Thos. Wormald, Esq., St. Bartholomew's Hospital.

[A very corpulent woman, aged 50, was admitted into St. Bartholomew's Hospital on 26th August, 1856, having dislocated her shoulder six weeks previously.]

It was observable that Mr. Wormald required a great deal of force to bring the articulation back to its proper or normal condition. The first and chief point which he tried to secure was *a fixed state of the scapula;* for if this bone continue, as usual, to move about, he believes it impossible to get the glenoid cavity into the proper position for receiving the head of the humerus, as the latter bone merely pushes the scapula before it. Mr. Wormald accordingly dispenses with the counter-extending sheet or girth commonly placed round the chest. Having placed the patient under the *full* influence of chloroform (for the earlier stages of chloroform, by causing muscular spasm, rather frustrate than aid the endeavours of the surgeon), he was enabled to make a full examination of the parts about the joint. He discovered the round head of the humerus farther forward under the pectoralis than he had ever previously observed it: most probably far at the inner side of the coracoid process. A fixed condition of the scapula was next obtained, by a plan at once novel and ingenious. A strong bandage was placed, like a soldier's belt, across the shoulder, and meeting behind: this, by using strong force against the upper border of the scapula (such as bringing the opposite end of the bandage under the surgeon's heel), at once fixes the scapula. A bent splint was now applied to the arm and forearm, the latter being flexed so as to relax some of the muscles (biceps and brachialis anticus) and to allow more easily of the necessary manipulations in a very fat woman. A second band, or long towel, was then carried round the arm, and a careful manipulative effort made to draw the head of the bone backwards and downwards; and, when it was assumed that the head was below the coracoid process, then forwards. Some crumbling or crackling sensations were first felt on Mr. Wormald commencing the former steps of the manipulation; this was due, in all probability, to the breaking down of old adhesions. The head of the bone was next felt to move gradually towards the glenoid cavity, which remained quite fixed. The adhesions had been six weeks growing; yet, by now modifying the manipulations a little, the bone slipped in with a noise.

As Mr. Wormald observed to his class, this dislocation is one of very frequent occurrence, though not met in practice so often as dislocation downwards into the axilla. Arguing from the analogous manipulation under chloroform in the hip-joint, now so often successful, the operator may trust more perhaps to manipulation than to what is more commonly known as the plan by forced extension and counter-extension. One of the chief points, hitherto overlooked, is to *fix the*

scapula, or rather the shallow cup of the glenoid cavity, which is only half the size of the head of the humerus in the perpendicular direction, and only one-third in the transverse ; but to which all the endeavours of the surgeon are directed, so that he may slip the large ball-like head of the dislocated bone into it.

From the history of this case, it seemed as if the head of the bone had been dislocated by the woman falling, while coming out of an omnibus ; the arm at the time was inclined backwards, and separated from the side ; the action of the muscles in front, by a secondary displacement carried the head of the humerus higher and higher. These cases, it need scarcely be added, are very troublesome in private practice in the country, as we can seldom command all the necessary assistance with chloroform, bandages, &c. Indeed, in this instance, the woman said the bone had been "set" by a surgeon before she came in, and she thought it all right. Dislocations of the shoulder are so common that some believe them to equal in number all other dislocations put together. The glenoid cavity is so very shallow and small, the joint is so comparatively unprotected by ligaments, and the motion of the shoulder so various and extensive, that we can only explain the fact of dislocation not occurring oftener by the singular mobility of the broad surface of the scapula. This very moveableness, however, of the scapula, according to Mr. Wormald, proves also the chief obstacle to the reduction of the head of the bone—a circumstance, he believes, entirely too much overlooked in practice, and only to be obviated by some such contrivance as that first mentioned.—*Association Med. Journal, Sept. 6, 1856, p. 755.*

52.—ON GUNSHOT INJURIES OF THE HANDS.

By John Wyatt, Esq., Coldstream Guards.

[The author relates several cases which elucidate principles of considerable importance connected with the conservative treatment of wounds of the hands. The reasons which have induced Mr. Wyatt to select these cases are: 1st, They are second to none in the anxious consideration which should always attend on their treatment.]

2. It is that part of the body, more perhaps than any other which, when afflicted with traumatic injury, will display the often miraculous reparative resources of Nature, and thus permit us to derive instruction which we may hereafter apply to injuries of more vital and concealed parts.

3. We observe, after any curtailment has occurred, in the smallest or greatest degree, with what wonderful compensatory adaptation the remaining portions are endowed. It has been said, as an aphorism, that amputation should be the last resource and even opprobrium of surgery, as death is of the practice of medicine ; still, that impossibilities cannot be humanly performed, or a limb or life saved which

sound experience says can no longer be preserved. In former days wounds of the hands and fingers were much dreaded, on account of the liability to tetanus; and for that and other reasons, I have no doubt that primary amputations would have been performed on three of the four cases I have adduced, and with probable recovery in all. Thanks, however, to the recorded experience of the late war, the practice of surgery is now tempered with less stern resolves; as the nature and treatment of gunshot wounds have become better understood, we place more confidence in the resources of Nature, and have become less desirous for the doubtful *éclat* of operations. It has been admitted that the type of diseases has undergone an extraordinary and almost radical change during the past five years, and that the cause for the severe treatment then employed has, consequently, long since passed away;—may we not, as practical surgeons, incline towards a similar opinion, with reference especially to gunshot wounds? for I conceive that the spoliative and expectant systems of treatment are but the analogues of operative and conservative surgery, the *status* of which we shall improve, in proportion as we prove it to be less of an art than a science. I believe that it would be most desirable to follow up the consecutive symptoms of a given disease, uncontrolled, to its termination; by that means alone shall we be able to estimate the value and force of our particular remedies.

Certain cases must have come under the cognizance of most practical surgeons during the war, where, after much deliberation with reference to the practice to be pursued in a very severe injury, the issue has been considered sufficiently doubtful to give the patient the chance of preserving his mutilated limb; and, almost contrary to all expectation, the result has proved successful. Such a case occurred to me last year. A man was wounded in the trenches by a fragment of shell, which carried away the whole of the sural vessels of one leg, fracturing at the same time the fibula, in two places. He had apparently a good constitution, and, after a most anxious reflection, I decided to give the man the chance of having even a distorted limb; although it was, by several surgeons, considered almost too great a risk. The man was himself much opposed to any operation. After great care and attention he was in eleven weeks considered sufficiently recovered to undertake the voyage to England, with rather an awkward leg, it is true; but still it was one which he would have been very loth to exchange for the best substance in cork or wood that could ever be produced. Monsieur Baudeux, the distinguished Inspector-General of the French army, who has lately made a tour of inspection through the allied camps, informed me, that it is extraordinary what an amount of preservation of limbs is now attempted, by resections, at their military hospitals, after injuries which formerly would not have been considered amenable to such treatment, and with more than great success; for it appears that, out of twenty-nine cases of resection performed by himself, only three were fatal, which is

a result, I think, sufficiently satisfactory; but they were performed in large military hospitals in France, and not in field hospitals, in position even, much less in bivouac after an action.

The more remote the seat of injury from the larger articulations, with the greater freedom, I conceive, may conservation be attempted; but, when preservation of limbs after injuries near the larger joints is attempted, the most mature deliberation is necessary; indeed, I cannot conceive a more important duty to devolve upon the military surgeon, or one requiring more experience of Nature's resources, as regards future prognosis; neither can I conceive anything so distressing as to be obliged to remove a limb which has proved useless after a *so called* cure of conservative surgery; and this contingency must be always remembered in military practice. I very much doubt if we are not always justified in attempting to preserve a portion of the hand, even after the most severe injuries; and in *Case* No. 1, detailed, I feel that we were equally warranted in attempting to preserve the phalanges; and had the constitution of the man been more vigorous, there is every reason, in my mind, to believe that the injury might have been repaired, as in *Case* No. 3, where even a greater damage was primarily inflicted. I think that, especially where the tendons are intact, notwithstanding that the metacarpal bones may be much comminuted, we should endeavour to preserve the phalanges, provided the patient's constitution is good. I must, however, confess, that I believe unless the state of the wounded after an engagement can be such as to render them free from the discomforts and dangers attending frequent locomotion, that excisions of the joints of the lower extremity should rarely be performed; and this opinion I have arrived at from very practical experience during this war. What, for instance, but an untoward result could be anticipated from those wounded soldiers who, after the battles of Alma and Inkermann, were removed to Scutari, there to be placed in a crowded hospital, after a tedious voyage of several days? If it be admitted that the after treatment of excision of joints require especial care and attention, then it is manifest, that where such cannot be obtained, it will not be desirable to venture too much in that direction. Hemorrhage after gunshot injuries in the hand is often most difficult to control; indeed, I know of one case where amputation was advised, after deligation of the artery had first been attempted with no success: in this case pressure at the seat of injury was impossible, on account of the inflammation and sloughing which had followed; every kind of styptic was also tried in vain: and the lad had lost a large quantity of blood: pressure was then carefully applied over the course of the radial and ulnar arteries, and, as ice could not be obtained, a syphon was constructed, by which cold water was allowed to drop perpetually on to the wound: this was continued for twelve hours, when all hemorrhage ceased, and subsequently a good recovery was made. It is also worthy of note, that during this war hardly any cases of tetanus

following wounds have been reported; and as such a complication was at one time supposed to be peculiarly liable to follow injuries of the hand in military practice, how can we account for the immunity during this campaign, except from the improved system of treatment employed? Of all gunshot injuries in the neighbourhood of the hand, I think the greatest danger to the subsequent recovery of the member arises from those cases in which a ball has penetrated the carpal bones alone, on account of the extensive irritation which ensues.—*Med. Times and Gazette, May* 24, 1856, *p.* 514.

ORGANS OF CIRCULATION.

53.—CASE OF LIGATURE OF THE EXTERNAL ILIAC ARTERY FOR INGUINAL ANEURISM.

By Dr. Wm. Philpot Brookes, Surgeon to the General Hospital, Cheltenham.

[Joseph ——, aged 57, a cabinet-maker, of a spare cachectic habit, states that about two years ago, when at his work, all on a sudden he felt great pain in the right groin, a swelling appeared, and for a month afterwards he could seldom walk. At the end of six months, as it gradually increased in size, he became alarmed, and consulted Mr, Charles Gregory, who at once detected the character of the tumour. There was aneurism in the right inguinal region, the size of a turkey's egg, pulsating very forcibly. The treatment by pressure could not be carried out on account of the extreme tenderness of the parts, and it was determined to tie the external iliac artery as near the common iliac as possible.]

The patient readily gave his consent, and on the 13th Feb. 1856, in the presence of numerous professional friends, I performed the operation at his residence. Making a semilunar incision, of 5 inches in length, commencing somewhat above the anterior-superior spinous process of the ilium, and extending to within an inch of the pubis, its convexity looking downwards, I dissected this flap, then dividing the aponeurosis of the external oblique muscle, reflecting it upwards, and passing my finger through the fasciæ transversalis, coming upon the sac of the peritoneum, I carefully pushed it upwards and inwards as far as possible, and reached the artery. I was now compelled to use the retractors, to keep the parts clear. The division of a small arterial branch, which bled most profusely, gave some trouble; one end being ligatured, and still continuing to bleed from the other, an assistant kept pressure upon it. I secured the external iliac, after carefully separating it from its accompanying vein with my finger-nail. Tied the vessel as high up, and as far from the diseased portion of the artery, as I possibly could. My ligature was waxed, thick silk. Ty-

ing the artery with a double knot, all pulsation in the tumour immediately ceased Both ends of the silk were brought out, and the wound united with sutures. During the administration of chloroform, which was kindly given by Mr. Hartley, the resident surgeon of our hospital, he became much excited ; had, however, no knowledge of the operation until placed in bed, and some minutes had elapsed after its completion ; his delight was not small when told all was over. The limb was enveloped in flannel, a warm brick kept to his foot, bags filled with baked bran were placed down each side of the thigh and leg, and the extremity was kept bent upon the pelvis.—Nine p.m.: pulse 92, and quiet: tongue moist, foot and leg warm ; feeling in it as acute as ever; complains of slight flatulence ; no abdominal tenderness. He begged to be allowed a pipe, having for years been accustomed to smoke several during the day, and saying, " I shall not sleep unless I have one." I consented, and he worked away at it most heartily. He also took a cup of gruel. The aneurismal tumour in the groin is not perceptible; no kind of pulsation can be felt by most careful examiuation.

[14th. Pulse 72. no abdominal pain. Foot and leg warmer than the other. A slight pulsation has returned.

15th. Pulse 82, all symptoms favourable, wound united ; tumour somewhat returned ; no pulsation in the femoral.

17th. Tumour larger, pulsating more, entirely commanded by pressure below the tumour: progressing favourably.

March 31st. The ligature came away, this being the forty-seventh day.

April 24th. Quite well. Circulation perfectly re-established ; walks with the limb as strongly as ever.]—*Lancet, Aug.* 16, 1856, *p.* 192.

54.—ON ANEURISM TREATED BY PRESSURE.

By T. Holmes, Esq., Surgical Registrar to St. George's Hospital.

I consider that the first contra-indication to the long continued use of compression in the treatment of aneurism would be constitutional irritability or failing health in the subject of the disease. The second I believe to be the position of the aneurism. When this latter lies in contiguity with the knee-joint (a fact which may be generally determined with an approach to certainty from the peculiar sensation communicated to the hand by the artery, raised on the swelling, the case will generally be observed to present much more urgent symptoms, and to call for proportionally prompt measures. The form and size of the opening is also a matter which must exercise the most important influence on the success of this method of treatment. When, for instance, the disease is more of the nature of aneurismal dilatation, it is, I believe, vain to hope for cure by any method which does not entirely cut off for a time the circulation of blood through the tumour—a result hardly to be obtained by the compression treatment, without an

amount of force which cannot be borne for more than a very short period. The size of the opening may, of course, be judged of by the loudness of the murmur, and by the time which the tumour requires to fill; and, therefore, an aneurism in which the bruit is loud and rasping, while the sac fills and empties itself slowly, is far more likely to be cured rapidly by pressure than one in which these conditions are reversed.

These few considerations will serve, I think, to remind us of the principal contra-indications to the *long continued* use of pressure: but are there any circumstances which forbid entirely the use of this method of treatment? I believe not, so long as the sac continues entire. While this is the case, and the general health of the patient is not so much deteriorated as to render some immediate and decisive step necessary, the diminution of the force of the circulation on the tumour cannot be otherwise than beneficial directly; while the enlargement of the collateral branches which must follow, from the diminution of the stream of blood in the artery below the instrument, while in the part above it remains of course the same, must have a very beneficial indirect influence upon the result of an operation by ligature, should that be found at last necessary. It is obvious that the risk of gangrene must be materially diminished when the lower extremity is already in great part nourished by the intervention of a fresh system of vessels.

It is true that, in my third case, gangrene did occur after ligature of the femoral, where pressure had been used for some time; but it seems probable, from the symptoms and course of that case, that the pressure had not been applied efficiently and in the proper direction. In fact, it was not easy to keep an instrument on each thigh, of the pattern of the Dublin instruments. A much lighter and more manageable *presse-artère* has recently been in use at St. George's (the invention, if I am not mistaken, of Mr. Blair, of St. James's Street), which acts very much in the same manner as the fingers of a man's hand; the broad part (representing the palm) lying below and outside the thigh, and the pad (representing the end of the fingers) being moveable on the connecting arm by a simple rack and pinion. This apparatus, presenting no projecting screws, &c., is not liable to be displaced as the other is by slight movements of the body, or by a similar instrument applied to the opposite thigh; while it is far more easily managed by the patient, there being but one simple screw to look after; and its lightness makes it far more comfortable to wear.

The general conclusion to which I have been led by what I have seen of the compression treatment in popliteal aneurism is this, that there are few or no cases in which the cautious use of pressure is not justifiable, the sac remaining entire; but that in persons of shattered constitution, in aneurisms lying in contact with the knee-joint, and in those which communicate very freely with the cavity of the artery, the surgeon should be prepared to give up the pressure after a short time, if no rapid improvement follows its use, and resort to the ligature.—*Association Med. Journal, June 28, 1856, p. 534.*

55.—*Perchloride of Iron in Nævus.*—Mr. Lawrence injected on the 15th, and again on the 22nd of March, a large nævous mass which had been gradually growing to an immense size in the cheek of a child, and spreading to the lower jaw. It was very evident that any other operation would be inadmissible, and the tincture of perchloride of iron seemed to succeed very fairly. About a drop at a time was left in or dropped into the morbid growth, at several punctures, from the now familiar waistcoat-pocket-sized glass syringe, which holds about half a drachm. The piston worked by a silver screw, two half turns constituting a drop. Eight such drops or punctures were made the first day; seven or eight, also, on the 22nd of March. Considerable consolidation and obliteration of the nævous structure followed both operations. We believe this plan very deserving of trial in those cases of flat and irregular nævus, where the ligature cannot be applied with satisfaction. It has the recommendation of great cleanliness and simplicity, and does not seem to cause unusual irritation or pain.—*Assoc. Med. Journal, April* 5, 1856, *p.* 267.

56.—*On Sub-Arterial Cysts of the Wrist.* By M. Chassaignac, Paris.—M. Chassaignac calls attention to a form of ganglion which, placed beneath the radial artery, unless properly understood, may give rise to very serious errors. From excess of labour, or the exertions necessary to raise heavy burdens, the small tumour may acquire considerable development. The fingers of the surgeon, when applied over the cyst, are raised by the pulsations, which are remarkable for their energy and the breadth of space they extend over. This extent of pulsatile surface immediately suggests the idea of radial aneurism, and if the examination be continued with the limb remaining in its ordinary attitude, an error can scarcely be avoided. The differential diagnosis may be established by bringing the wrist into a state of forced flexion, when—whether it is that the artery is displaced, or that it ceases to be stretched over the eminence formed by the cyst—the pulsations no longer exist, and it is evident that no aneurism is present. In treating these cases, M. Chassaignac employs the iodide of potash ointment, rubbing it in every two hours during a week. On the dorsal surface we may treat ganglia with advantage by crushing them, by subcutaneous puncture, seton, or iodine injection; but in the case of these sub-arterial cysts of the wrist, which are in communication with the radio-carpal articulation, these means of treatment are not applicable. The iodine frictions give rise to no accident, and seem possessed of all desirable efficacy.

On one occasion, M. Chassaignac had the opportunity of examining one of these cysts in a subject brought for dissection. The tumour resembled an almond in form and size, and occupied the space comprised between the tendons of the *supinator longus* and the *palmaris longus*, lying on the anterior portion of the *pronator quadratus*. The

radial artery in its downward progress having reached the upper part of the tumour, was at first so intimately connected with its front part as to seem to form a portion of its walls. Very soon, however, it deviated obliquely on its external side, and reached the fossette called the anatomical snuff-box. With the object of ascertaining the anatomical origin of the tumour, it was dissected with the greatest care, and separated from all parts with which it had not contracted fixed adhesions. In this way it was circumscribed for four-fifths of its extent, but posteriorly and below it was firmly fixed to the bone by a kind of pedicle proceeding from the anterior part of the lower radio-cubital articulation. It was only, in fact, a diverticulum of the synovial membrane of this joint, and it has raised up the lower fibres of the *pronator quadratus*, which, forming a kind of arc, produced a sort of strangulation of the pedicle at its upper part. The continuity of the cyst with the articulation was completely demonstrated, a probe freely passing from one to the other.—*British and Foreign Med-Chir. Review, October* 1856, *p.* 546.

57.—*Liquor Iodo-Tannique as an Injection for the Cure of Varices.*—M. Desgranges passes in review the different modes of treatment employed for the cure of varicose veins. The two he considers the most eligible are, first, the external application of caustic, and, second, coagulating injections. On comparing these methods, he prefers the latter, as being more sure and less painful, and not leaving any mark on the skin. Of the coagulating agents, the perchloride of iron he admits is very powerful, but he has found the *iodo-tannin* solution also very efficacious. He reports a favourable result in six out of seven cases. The injection is to be used in the same manner as the solution of the perchloride, but five or seven drops of the new preparation produce only the same effects as two drops of the former.—[No formula is given.]—*Gazette Medicale.—Dublin Hospital Gazette, June* 1, 1856, *p.* 141.

58.—*Varicose Veins.*—Some late trials of the "Vienna paste" by Mr. Skey, in cases of varicose veins, in one of his wards of St. Bartholomew's, have been crowned with remarkable success. Mr. Skey usually, as we have seen him, mixes the paste himself, in the proportion of about two of caustic potash to three of lime, previously powdered and preserved in stoppered bottles; we have observed he mixes these by means of spirits of wine. A hole is next cut in the centre of three or four thicknesses of adhesive plaster, placed over the varicose enlargement, and a spot the size of a threepenny piece exposed; then, with a bone spatula, or one of asbestos, a very small portion of the paste is let into the hole of the plasters, and allowed to remain on about twenty minutes, followed by a large poultice, placed subsequent to an entire sponging of all the limb, so as to free it from the potash

and remnants of plaster; eight or ten such eschars are generally sufficient to obliterate the veins in ordinary cases. Mr. Skey believes that the cause of the disease is usually a *remora* in the venous circulation, due to want of power to propel the blood, and that this condition of the system must not be lost sight of if we propose to eradicate the original disease effectually. He accordingly orders usually such medicine and diet as may assist the treatment; bark, in form of the liq. cinchonæ, iron in other cases, opium when necessary, wine, porter, and animal food. Mr. Skey is not much in favour of purgatives, and is quite a disbeliever in what is called "improving the secretions," or clearing out the portal system. But, in a very large number of cases, not much under sixty or seventy, he states he has found this method of treatment of varicose veins by the potash and lime quite sufficient for all purposes. He believes it safer than the method by ligature, which we have also seen recently adopted with very fair success by Mr. Stanley in other cases, by Mr. Erichsen at University College Hospital, and by various other surgeons. The chief point in the treatment by the ligature is to get fully beneath the vein; if the vein be transfixed, we shall have phlebitis of a bad kind at once supervening.—*Association Medical Journal, April 5*, 1856, *p.* 268.

ALIMENTARY CANAL.

59.—ON THE EMPLOYMENT OF CONGELATION IN OPERATIONS ON THE MOUTH.

By J. R. Quinton, Esq.

[In the report of a successful case of staphyloraphy, by Mr. Field, it is stated that congelation of the palate was tried for more than an hour, but totally failed. Mr. Quinton thinks that no surface of the human body can resist its benumbing influence if it can be properly brought in contact with the congealing agent. He says]

Considerable experience in the application of cold in operations on the mouth has shown me that, First, the cold should be applied in a fluid or semi-fluid form, accompanied with pressure. By this means it can be applied equally to every portion of the required surface. Secondly, such cold fluid should be subject to repeated or uninterrupted change; otherwise the heat absorbed from the mouth would raise its temperature, and thus counteract the anæsthetic effect. Thirdly, the fluid should be of sufficiently low temperature to produce an anæsthetic result, adequate to the nature and severity of the operation. Fourthly, it should be enclosed in a very fine preparation of india-rubber, or thin membrane, which, without interfering with its efficacy, would prevent the ingredients escaping and irritating the mouth. The employment of india-rubber, at my suggestion, has been found most serviceable in the application of cold generally, especially when the surface is abraded, and in cases of cancer, &c.

There are several ways in which an unalterably low temperature may be continuously applied to the mouth. A body of water, cooled down by ice and salt to zero, or by the addition of nitrate of ammonia and other salts to almost any degree below zero, may be passed in a continuous current over the part, through a delicate membrane moulding itself by the pressure of the fluid to the form of the surface. A current of cold, either direct or graduated, is not, however, indispensible to operations on the mouth, as has been supposed.

The desired anæsthetic effect may be gained by enclosing a cold and easily soluble freezing mixture in a vessel having a tube, the terminal portion of which may be adapted extempore to the nature of any case; the exposed portion being covered with thin india-rubber or membrane and applied to the part. It is only necessary to subject the contained fluid to occasional change and admixture to maintain or produce any degree of cold that may be desirable. I have contrived a small apparatus of the latter kind, the more minute description of which I reserve for a future opportunity, when I can illustrate it by a diagram. By a few minutes' application of either of these processes a perfectly successful anæsthesia may be obtained. The current process having been made the subject of a patent is unfortunately unavailable to the medical profession generally.

I have not had an opportunity of employing congelation in a case of staphyloraphy, but I have frequently had occasion to freeze large portions of the palate, and I have always accomplished it with the greatest ease. And the success I have met with in removing teeth, exfoliations, &c., of which Dr. Arnott, Dr. Druitt, and others have been witnesses, places the possibility of successfully employing a properly-managed congelation in operations on the mouth beyond a doubt.—*Medical Times and Gazette, Aug.* 30, 1856, *p.* 223.

60.—ON CLEFT PALATE.

By Dr. Maurice H. Collis, Surgeon to the Meath Hospital, &c.

[Of the recent additions to our knowledge on the subject of cleft palate, we must first notice the observations of Mr. J. M. Warren, of Boston, who says, that the deficiency is not merely a cleft, but that the elevation of the arch or vault of the mouth is increased, and the imperfect palate is the segment of a high and pointed arch; in fact, the bony palate is not so much deficient as misplaced. To remedy this, he detaches the soft coverings of the bones from the margins of the cleft outwards, so that they may unite at a lower level in the mesial line. Mr. Fergusson, in 1845, brought forward some cases in which he had operated successfully upon the velum palati. The peculiarity of his practice consisted in dividing the levator palati and tensor palati muscles. Subsequently the late Mr. Avery, of Charing Cross Hospital, and Dr. George Pollock, of St. George's, brought Mr. War-

ren's plan of operation into notice. Dr. Pollock divides the operation into two periods, on account of the danger which there is of the thin flaps being imperfectly nourished and sloughing, from the anterior and posterior vessels which supply the flaps being necessarily cut through at the same time. It is much better to operate upon one half at a time, and allow a few weeks to elapse, so that the collateral circulation may be established before proceeding with the remaining half.]

In deciding the question of precedence in the two stages of the operation, we are to be guided by the relative extent of the fissure. Thus, where it is almost wholly confined to the soft palate, it will be well to operate on it first; where, however, the bony vault is much divided, it is better to commence with it. This portion of the operation is more painful and tedious, and where the cleft is extensive the soft palate is frequently scanty, and cannot be readily brought to meet at first. The separation of the flaps from the bone not only lowers the arch, but elongates the palate backwards; a larger palate is thus obtained, while it is also more easy to bring and retain the divided uvula in contact. For all these reasons I prefer to operate on the hard palate first, whenever the cleft extends forwards into the superior maxillary bones. Another advantage is, that the immediate improvement in articulation is more marked, and the comfort in swallowing greater, as soon as the cleft in the hard palate is closed, while all improvement after union of the soft palate is slow, and acquired by care and perseverance. These principles guided the course which was adopted in the two following cases:—

Case 1, was that of a gentleman aged 22, residing in London, of somewhat nervous temperament, but possessed of great determination. The fissure was congenital; it extended forward through fully two-thirds of the hard palate, and terminated anteriorly in a sharp point; the separation between the bones at their posterior margin was three and a quarter inches; the section of the arch was high; the edges of the bone were almost as sharp as a knife, and barely covered with a fibro-mucous membrane tightly stretched over them; external to this, however, there was a good pad of soft parts just above the prominences of the alveolar ridges; the uvulæ were moderately large, and met fully during the efforts of deglutition; his speech was very indistinct and guttural, and getting worse each year; although in general able to swallow without inconvenience, yet, when troubled with cough, food and drink often passed up into the nose and gave much annoyance. Some years ago he had worn an obturator for a little while, but was obliged to discard it in consequence of food getting behind it and remaining there. It was determined, in this case, to begin with the cleft in the hard parts: accordingly, on the 7th of July last, the operation was commenced at 4 o'clock in the evening, after he had dined heartily. The soft parts covering the bones were separated, by suitable knives, to a sufficient extent to allow of their edges slightly overlapping each other in the mesial line; the edges were then pared

with a narrow spear-pointed knife, which removed a thin layer, and enabled the edges to lie in perfectly even contact; three points of suture were then inserted and fastened with a running noose, on which a common knot was tied; the sutures were loosely tied, as the object was to prevent the parts being dragged asunder by accidental violence rather than to draw them forcibly together. The operation, at which I was present, was ably performed by Mr. Pollock; it occupied nearly an hour; and the pain, which would otherwise have been considerable, was much diminished by a liberal allowance of wine, and by washing the parts freely with iced water. Union took place rapidly, and through the entire length of the part operated on except the posterior angle, which remained open. The sutures were removed about the fourth, seventh, and tenth days. The patient was allowed an abundance of fluid food for the first 36 hours,—beef-tea, wine, eggs beaten up with wine, and tea; after that he was allowed soft food for three days, and on the fifth he ate some meat. He got up after breakfast on the second day: drove out on the third; and was able to travel on the eighth day from London to Paris, without risk or inconvenience.

The second portion of the operation was performed in the latter end of October, also by Mr. Pollock; I was not able to be present on this occasion. It differed from Mr. Fergusson's operation in the following particulars:—First, a strong thread was passed at the commencement through each portion of the uvula. This I had done, by Mr. L'Estrange's advice, in a previous case of my own, with great benefit. It enables the operator to dispense with a forceps, which must more or less bruise the parts; it also gives greater power to draw the points of the flaps in any direction, and assists to make them tense; the cord also acts as a suture when one is required at the close of the operation. The second point of difference was, that the muscles were divided from the front in the manner I have described above. The operation lasted about half an hour, and the treatment was similar to the former occasion.

I have seen this gentleman since; his speech is wonderfully improved. A small opening remains unclosed about midway in the original cleft, which is covered for the present by an obturator, but will be closed in time, either by caustics or by a trivial operation.

Case 2.—James Walsh, aged 22, a labourer, was sent to me by my friend, Dr. Shiell, of Malahide, in July last. His palate was congenitally deficient to a considerable extent; the cleft extended anteriorly through half the hard palate; the apex was sharp; the vault of the mouth was high, as in the former case, and the edges of the bones sharp and thinly covered. It resembled the other case in every particular except that the cleft in the hard parts was not so extensive; I therefore preferred to operate on the soft parts first. Accordingly I did so on the 1st of August, with the assistance of Messrs. L'Estrange, Jameson, Quinan, and others. I commenced by putting the guiding

threads through the uvulæ; then I divided the levator palati from behind with Warren's knife, first on the right, then on the left. I found the knife very inconvenient, both in the shape of the point and in the shortness of the blade; it required several stabs to completely paralyze the flaps. I then divided the palato-pharyngei with the curved scissors, as I found that they drew the flaps backwards and outwards; the flaps then lay fully in contact; I next pared the edges, and inserted four points of suture. The operation was tedious, owing to the imperfection of the knife which I had for dividing the muscles, and also in consequence of the patient obstinately refusing to take any wine: his exhaustion near the close of it was so great that I had great difficulty in inserting the last two threads. Union took place perfectly through more than three-fourths of the part operated on. The anterior part, just at the junction of the soft palate with the hard, did not unite by the first intention, nor did the extreme tip of the uvula; the sutures were removed at intervals from the fifth to the tenth day. I should have stated, that the two upper sutures were inserted fully four lines from the margins of the flaps; by this means the little circle of inflammation which they set up did not interfere injuriously with the adhesive process going on in the edges, and there was no occasion for disturbing them for several days; the treatment, as regards regimen, was similar to that detailed above, as recommended by Sir Philip Crampton.

Three weeks after the operation, union was quite perfect and the cicatrix firm: an opening now remained of an oval shape, nearly an inch long, and half an inch wide: this might have been closed by an obturator; the station of the man, however, precluded the probability of his using any mechanical appliance properly; I therefore determined to close it by bringing down the coverings of the bones and uniting them in the mesial line; this I did on the 23rd August. Two points of suture were required, and I left them in for upwards of a fortnight. My object in doing so was to cause the exudation of a large quantity of plastic matter above the flaps, so as to keep the palate permanently at a lower level. This operation succeeded perfectly. A small pinhole remained for a time unclosed at the point where the two operations met, but was brought to fill up by a few touches of caustic. The immediate improvement in this man's speech was considerable.

This is the first instance, as far as I am aware, of Warren's operation upon the hard palate having been performed in this country. Operations upon the soft palate have been occasionally performed, with various degrees of success, but the number even of these is very small when compared with what Roux and Fergusson have done, not to speak of others in England, America, and the Continent. The affection is by no means uncommon: I have seen eight cases in adults within the last year, besides others that I have been consulted about by letter; nor is the affection confined to any class or position in society; I have met with it in all ranks and from all parts of the country, and I know that

persons have gone to London or Paris to be operated upon. There is no question that the operation is trying and difficult, more particularly the portion upon the hard palate; it is also tedious, owing to the necessity for frequent rinsing of the mouth. All these difficulties, however, can be lessened by a careful selection of instruments, and by accurately informing ourselves upon the peculiarities of each case before commencing the operation.

I wish now to draw attention to some points of importance in the various steps of the procedure, with the view of inquiring into the means by which it can best be shortened and simplified. It is to be remembered, that the position of the patient prevents the use of chloroform, from the risk of suffocation by blood trickling into the larynx. As the operation is both painful and tedious, a free supply of wine should be given before and during the operation. In the first case, the gentleman took nearly a bottle of port wine without its producing the least bad effect upon him: in the second, where the man obstinately refused it, the operation was prolonged considerably by his physical exhaustion.

I have already insisted on the advantage to be derived by passing a thread through each portion of the uvula, as the first step in the operation on the velum.

The mode of dividing the muscles recommended by Fergusson is founded upon accurate anatomical knowledge, and is tolerably easy and certain in the hands of a thorough anatomist. Mr. Pollock's plan of dividing from the front is more easily and rapidly executed. Dieffenbach's incisions were not founded on anatomical data, and were not therefore so generally successful as regarded their object. Roux's incisions were even more at random, and in a worse direction, and must, in many cases, have left an awkward and permanent gap between the soft and hard palates. It has been denied by a distinguished surgeon, that any incisions are required, and a good deal of ridicule has been expended upon Mr. Fergusson's admirable improvement, but, as these statements are unsupported by argument, they are of little value, especially as the writer who makes them is given to find fault with most modern improvements in surgery which do not emanate from himself. According to Mr. Fergusson, the levator palati is the principal muscle which draws the flaps asunder: the palato-pharyngeus also; the tensor palati affords but few disturbing fibres, and the action of the palato-glossus is useful in the early stages of deglutition, and, in the later stages, any evil it could do is counteracted by the superior constrictor. Now, for the purpose of dividing the levator by the smallest possible incision, the point selected by Mr. Fergusson is the best—the belly of the muscle is divided before it expands upon the velum; it is, however very difficult to reach the muscle at this point; it is above the palate and to its outer side, and it requires some nerve to use the sharp-pointed knife which he employs with sufficient boldness, for the carotid is at no

great distance behind, and a trifling error might do serious mischief; besides, there is a difficulty not noticed anywhere, namely, during the involuntary motions of the pharynx, the point of the knife is liable to catch in the membrane, and so to increase the spasm of the muscles. Having experienced this, I would recommend the knife to be slightly probe-pointed; by this means it will be impossible for it to get outside the pharynx and wound any vessel of importance; with a knife bent on the edge, at a right angle, and probe-pointed, the section is easily and rapidly made. It is introduced with the cutting edge downwards, until the angle is beyond the velum; by a slight rotation of the handle, the point is turned right or left, and made to rest on the upper surface of the velum, pointing obliquely upwards as well as outwards, then, by drawing it forwards, and slightly outwards, the levator is cut across against the pterygoid plate, and the flap falls paralyzed. The movement is easy of execution with a little practice, and perfectly safe. Comparing it with Mr. Pollock's mode, I should say that his would readily succeed with an expert person who could use both right and left hand equally well. My knife has, however, the advantage that the muscles at both sides can be divided with the right hand, and without removing the knife from the mouth; it also does not interfere with the velum at all; the incision is removed to a greater distance, and is smaller in extent. In cases where the soft parts are very scanty, an incision passing completely through the soft parts will assist in approximating the edges of the fissure. In such cases Mr. Pollock's proceeding possesses a decided advantage.

The selection and the mode of inserting sutures have been always points of difficulty. Roux used threads waxed, and flattened into a kind of ribbon, as less liable to cut out. If the muscles are properly divided, and the suture inserted sufficiently far from the edge, there is no strain upon the sutures, and no fear of their cutting out. The flat suture is, however, useful, especially in the hard palate; it keeps off the accidental injury that food may do to the union while soft, and its presence between the flaps and the bones causes a copious plastic exudation which strengthens and thickens the new palate, and affords a bond of union between it and the bone. I should also be disposed to insert a broad suture at the point where union most frequently fails, namely, just at the junction of the hard and soft palate, where a small oval opening commonly remains; as happened in both the cases I have related. Dieffenbach's lead wire might be useful if an operation were to be attempted upon the bone itself in very early life; in any other case it is a clumsy contrivance. The mode of inserting the sutures may be indifferently from behind or before. Mr. Fergusson's fixed needles are very convenient. I have, however, found that I can place the needles more rapidly by having them very short, mere spear-heads, with an eye close to the point. I have them mounted on a fine steel staff, in such a manner that, when

thrust through the flap, they remain behind when the staff is pulled back; the needle point is now drawn out of the mouth, remounted on a curved staff, and then passed from behind forwards through the opposite flap. The same thread is thus inserted in both sides, and with great rapidity. By having three or four staves, and by taking the temper out of them, so that they will take any curve, it is easy to place a suture anywhere.

The best mode of fastening the sutures is that described by Mr. Fergusson: one end of the suture is passed through a loop made by the other, and this slip knot is pulled into the mouth until the thread is sufficiently tightened across the palate; it is readily prevented slipping until a common knot is tied over it, but as no suture ought to be tightly drawn, the kind of knot is of less consequence. If the thread be too tight, it will cut out in whole or in part, and union will not take place in the point under it. The sutures should be left in for a good while: they protect the soft cicatrix, and can do no harm. The food should be abundant and nutritious, but soft and semifluid for a few days. In one case I knew that the patient broke up the adhesion several days after union had taken place, by eating a piece of hard potato. Speaking should also be interdicted for four or five days, or even longer, in the case of soft palate.

The subsequent education of the voice is essential to success in speaking; it is astonishing how little apparent improvement is made without it, and how much may be done by it. Reading aloud slowly should be inculcated in all cases.—*Dublin Quarterly Review, May*, 1856, *p.* 264.

61—OF FISSURE OF THE HARD PALATE.

By A. G. Field, Esq., Demonstrator of Anatomy at St. George's Hospital Medical School.

[The great difficulty of closing openings in the hard palate when caused by disease, is admitted by all surgical writers. The following case not only illustrates the difficulties and disappointments which attend the operation, but points out a means by which success may be attained. Mrs. G., aged 47, has had disease of the palate and separation of a considerable quantity of bone, on recovery from which an opening was left large enough to admit the little finger. Before operating an attempt was made to freeze the part, but it did not succeed.]

Failing in my endeavour to produce congelation I proceeded to operate according to the method of the late Dr. Warren. Having carefully removed the edges of the opening with a small scalpel, an incision of a little more than an inch in length was made, from behind forwards, quite down to the bone on each side, and about half an inch external

to the fissure. The soft parts included between these two incisions were then perfectly separated from the bone, by means of an instrument which I will presently describe. When this was done, the flaps so formed by the detached soft structures met together over the opening, where, as soon as bleeding had been arrested by freely bathing with iced water, they were retained by three sutures introduced in the manner practised by the late Mr. Avery. After the operation was completed one small artery bled freely, and required sustained pressure with the point of a finger to arrest it. The sutures were allowed to remain in five days, during which time the patient abstained from solid food, but partook freely of beef-tea, porter, &c.

The result of this operation was a considerable diminution in the size of the opening, but when the parts had quite cicatrized a hole remained of about half the original size.

June 11. The operation was repeated, but this time the edges were pared obliquely, the mucous membrane of the nose being removed on one side, that of the palate on the other, so as to allow the edges to overlap each other, whereby a larger extent of raw surfaces were brought into mutual contact. I also used the quilled suture, instead of the simple interrupted suture which had been employed in the former operation. This interfered less with the circulation in the flaps, while it afforded them more perfect support. After the second operation a hole still remained, about as large as a pin's head. This I tried to close by cauterizing with a hot wire, but as nothing was gained by that, after the cicatrix had formed, I brought the parts together on the 30th of June in the same way as before, in addition to which I supported the flaps in contact by well stuffing the lateral incisions with cotton wool. When the sutures were removed, six days after complete union appeared to have taken place, and I was just rejoicing in my success when I observed a small discharge of mucus, which, on more careful examination, I found had passed from the nose through a minute fissure. In a few days this increased, a little ulceration took place, and at the end of a fortnight the opening was considerably larger than before the last attempt to close it.

17th. I performed the fourth and last operation, my patient cheerfully submitting, being encouraged by the comfort she experienced from what had already been accomplished. This time I proceeded with, if possible, more elaborate care than on the former occasions, and having completed the other steps of the operation in the same way as before, I carefully dried the parts and washed them over with a solution of gutta percha in chloroform, and then adapted a thin sheet of gutta percha over the whole surface. This I did because I believed failure in my previous efforts to obtain complete union depended on a portion of mucus being drawn from the nose between the edges of the flaps in the act of swallowing, which it is impossible for the patient wholly to avoid. This belief was strengthened by observing, after the failure of the third operation, that the shred of mucus was drawn further into

the mouth after each time the patient closed her mouth for the purpose of swallowing the saliva which collected in it, while it was held open for examination; and I imagine it occurs in the following manner:—When the first part of the act of deglutition has been accomplished, and the morsel has passed beyond the reach of the tongue, the upper surface of that organ is left accurately applied to the roof of the mouth, and its return to the position it usually occupies is effected by the genio-hyoglossi muscles, which being inserted near to the median line, would, by their contraction, depress the middle of the tongue first, while its sides were still in contact with the palate; by this means a degree of suction would be produced whereby the loose edges of the flaps would be liable to displacement and to have the nasal secretions drawn down between them into the mouth, preventing union of their surfaces, however accurately they may have been adapted. Whether my explanation of the usual cause of failure when this operation has been performed be correct or not, I submit to the decision of more competent judges; but certain it is that I had the happiness of completely accomplishing my object, the removal of a very distressing annoyance to this poor woman, for all that now remains to be seen in her palate is a linear cicatrix in the situation of the opening which had caused her so much trouble, and a broad scar on each side, caused by the gaping of the lateral incisions, which were rapidly filled up with granulations and covered over by mucous membrane.

The instrument which I have found most useful in detaching the soft parts from the hard palate is here represented. It differs from those used by the late Mr. Avery in having the blade set on obliquely, so that it allows the flat surface to be applied against the palate, while the handle and hand of the operator are free of the lower jaw. The bend in the neck of the instrument is also advantageous in giving the operator more perfect command over the movements of the blade. With such instruments (a different one being of course necessary for each side) I have always been able to accomplish the most troublesome stage of the operation with ease and rapidity.—*Med. Times and Gazette, August* 23, 1856, *p.* 190.

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62.—ON HERNIA.

By Thomas Bryant, Esq., London.

[What form of hernia is most common? What form most frequently requires operation? and which is the most fatal? are questions which are constantly asked. To aid in the solutions of these questions, 126 fatal cases have been collected from the records of Guy's Hospital. The conclusions which have been come to from these are as follow:]

Conclusions.—1. That *inguinal* hernia is more common than femoral by 77·7 per cent.

2. That *inguinal* hernia most frequently commences between 20 and 40 years of age, and *femoral* between 50 and 70.

3. That the average duration of inguinal hernia prior to its strangulation is 20 years, of femoral 11.

4. That inguinal hernia most frequently becomes strangulated before 50 years of age, and femoral after this time.

5. That the average age of persons with strangulated inguinal hernia is 43, of femoral 55.

6. That femoral hernia requires operation 25·2 per cent. more frequently than inguinal, success in its reduction by the taxis being less frequent.

7. That, after operation, inguinal hernia is more fatal than femoral by 16·6 per cent.

8. That 22 per cent. of cases requiring operation are recent, and are strangulated on the first descent.

9. That three-fourths of these recent cases are *femoral.*

10. That the average period of strangulation in fatal cases of inguinal hernia is 50½ hours, of femoral 76½.

11. That half the fatal cases of hernia die within 48 hours after the operation, and four-fifths within the first week.

12. That three-fourths of the cases which refuse to rally after operation are *femoral.*

13. That collapse and death after a copious motion is by no means a rare occurrence.

14. That artificial anus much more frequently follows *femoral* than inguinal hernia.

15. That the cause of death in cases of artificial anus is generally exhaustion; that death occurs more rapidly when the intestine is slit open at the time of operation, than when the opening in the bowel naturally follows its return into the abdomen.

16. That sudden collapse and death occasionally occur in cases of hernia which have progressed favourably for many days, without any *local* cause.

17. That in about 69 per cent. of fatal cases, peritonitis exists sufficient to produce death; that is to say, lymph in some of its forms is generally effused,

18. That in nine-tenths of the cases of hernia, the *ileum* is the por-

tion of bowel strangulated; and in three-fourths of these it is part of the last two feet.

19. That as a rule, the strangulated bowel, when returned, rests or is fixed by adhesions at the mouth of the sac.

20. That in *all* cases of gangrenous bowel the affected portion will be found at, if not adherent to, the mouth of the sac.

21. That femoral hernia is much more frequently associated with gangrenous bowel than inguinal.

22. That ulceration at the line of stricture is more frequent in inguinal hernia; although the sulcated condition of the bowel is as common in femoral as in inguinal.

23. That fæcal extravasation, if not produced by ruptured bowel from the taxis, generally follows ulceration at the line of stricture, and is consequently generally found in inguinal hernia.

24. That ruptured bowel from the taxis is most frequent in femoral hernia.

25. That fæcal extravasation does not necessarily follow rupture of intestine by the taxis.

26. That fæcal extravasation does not occur so often as 50 per cent. in cases of rupture or perforation of the bowel.

From the above conclusions it is clear that—

Inguinal hernia is more common than femoral; commences earlier in life; is less liable to strangulation on its first descent, and generally exists twenty years before it becomes so; requires operation less frequently, but is more fatal; is less frequently associated with gangrenous bowel, but more frequently with ulceration at the line of stricture.

Femoral hernia is less common than inguinal; seldom appears before 50 years of age; is more frequently strangulated on its first descent, but generally averages eleven years' existence; more frequently requires operation, but is less fatal; and is generally strangulated for a longer period before relieved. After operation, femoral hernia is more frequently followed by sinking than inguinal; is more frequently succeeded by gangrenous bowel and artificial anus; but is less frequently associated with ulceration at the line of stricture and fæcal extravasations unless this occur from rupture by the taxis, to which it is *more* liable.

Practical Deductions.—The preceding conclusions, brought out as they have been by a careful analysis of the materials collected—and each of which, it is believed, will be acquiesced in as facts by all who take the trouble carefully to peruse these pages—must necessarily yield (what all researches should invariably tend to) some practical points, either to guide us in the future practice of our profession, or to warn us from dangers, palpable or obscure.

1. The first point that may be dwelt upon, and which appears as clear as it is important, is the necessity of operating earlier in femoral

than in inguinal hernia. The danger of delay in all cases, where strangulation is evident, is now so well appreciated by surgeons generally, that there is no necessity to stimulate such a feeling; but, unfortunately, there is need to urge them to act upon the knowledge of it; for the fact that so many cases are admitted into Guy's Hospital, in a dying and hopeless condition, proves too truly that such is not sufficiently understood, or at any rate is not practically carried out. But in femoral hernia delay is of peculiar importance, for three-fourths of the cases which refuse to rally after operation are of this kind. This fact alone is sufficient to indicate, that in femoral hernia, the ultimate result of all strangulation, namely, death of the part, occurs more rapidly than in inguinal. But when with this it is considered that this form is generally found in old women, who are, of course, less able to resist any such injury; that gangrenous bowel and artificial anus are much the most frequently associated with it, the truth (for such it must be called) that femoral hernia passes into a state of gangrene more rapidly than inguinal, becomes evident; and, as a result, the practical conclusion remains to be drawn, that in femoral hernia early relief is most imperative. And here the form in which it is to be applied must not be passed over; for recognising the conclusion that ruptured bowel from the taxis is most frequent in femoral hernia, together with the fact just mentioned, that gangrene is most frequently associated with it, the inference that the taxis should be employed sparingly and carefully cannot but be drawn. Our rule, then, in such cases, should be, to operate early; to let nothing like force, be employed in the attempt at reduction, and not to let valuable time be lost by baths and other fancy remedied. To support also such an opinion, another argument may be employed, deduced from the conclusions numbered 1 and 6. It will be there seen that femoral hernia is less common than inguinal by 77·7 per cent., and yet requires operation 25 per cent. more frequently; leading us most fairly to infer that, when down, the taxis seldom succeeds in its reduction; and coupling this with the preceding remark, the practical conclusion just drawn, becomes more apparent in its truth. The anatomical reasons for this it might not, perhaps, be difficult to explain; but, as it is only intended to make remarks upon points which the materials collected seem to warrant, it will suffice to say that the smallness and unyielding nature of the crural ring, together with the sharpness of Gimbernat's ligament, seem sufficient for its explanation.

2. With these anatomical conditions are closely connected in interest another point, which certainly at first sight appears strange. In the twenty-second conclusion of the table, it is stated that ulceration at the line of stricture is more frequent in inguinal, although the sulcated condition of the bowel at the line of stricture is as common in femoral hernia. The materials for drawing such an inference could warrant no other conclusion, and it can hardly be stated to be a chance that the cases collected should indicate such

a result; for although the numbers of each species in which sulcated bowel was detected were equal, in no one case of femoral did ulceration exist; in several commencing gangrene coexisted, and in one rupture from the taxis, but not in the line of stricture. That such ulceration does occur is not to be denied; but, as a rule, the tightness of the stricture seems so intense that death of the part is the general result; the more general and less rapid constriction of inguinal hernia, being, apparently, required to produce ulceration. That such an opinion is reasonable analogy well bears out; for in surgery the appication of a ligature to an artery, a nævus, or a polypus, if well and firmly applied, is first followed by sphacelus of the distal growth, and subsequently by ulceration, but if timidly applied, and without producing a total arrest of the circulation, ulceration will be the first if not the only consequence.

In the bowel, then, why should a different termination be expected? The general smallness of strangulated femoral hernia, and the anatomical peculiarity of the ring, acting and reacting upon one another, are rapidly followed by gangrene (unless relieved), and then ulceration. But in inguinal hernia the larger and more dilating neck, the greater mass of bowel which generally exists, affording, by its size, as it were, a cushion for the resistance of the former, is as a rule more frequently succeeded by ulceration.

3. That collapse and death after a copious motion is by no means a rare occurrence, is a conclusion perhaps recognised by all; but there is a point connected with it which may be considered worthy of a few remarks, and also of some practical importance.

The administration of purgatives after herniotomy is now, happily, obsolete; but the anxiety of the surgeon to witness a return of the action of the bowel, has not, perhaps, so subsided, as to prevent a frequent, and may be too frequent, use of the enema: that such is the case occasionally, is not to be doubted, for the too frequent remarks in notes of reported cases, such as "collapse and death after a copious stool following an enema," forbid any other conclusion. The subsequent treatment to herniotomy by opium is chiefly vaunted (and with perfect justice) for its value in preserving rest to the returned bowel, and thus allowing it time to regain its tone before being called upon to perform its natural duties. And here the question presents itself—Why urge it then at all? The lower bowel, on the first appearance of strangulation, is not unfrequently emptied of its contents, and seldom is it found after death at all distended with fæces; not so the upper portion. As a rule this will be seen full of liquid excretion, ready as it were to "flush" the lower intestine the moment the returned bowel has sufficiently recovered to permit its passage. Why, then, administer enemas? for although their action is not to be compared to the mischief produced by purgatives, still they do stimulate the intestinal canal, and unquestionably at times hasten, if not cause, death. That they are of value, and necessary in some cases,

cannot be questioned: still as a rule, perhaps, they should not be administered, and certainly not merely to hasten the action of the bowel, unless decided symptoms are present which denote its over-distension.

4. In conclusions 19 and 20 it will be seen that, as a rule, the strangulated bowel, when returned, rests, or is fixed by adhesions, at the mouth of the sac; and that in all cases of gangrenous bowel, the affected portion will be found at, if not adherent to its mouth. If this latter is a rule, as it doubtless is, with only such rare exceptions as every rule possesses, the practice of stitching the edges of a bowel, when found in a gangrenous condition and opened, to say the least of it, is unnecessary. The object of such a practice, viz., to prevent the retraction of the divided portion from repassing into the abdominal cavity, and thus producing fæcal extravasation and its attendant consequences, being happily prevented. The inflammatory action which always attends strangulation of the bowel, and more especially at the sac's neck, carefully provides for this contingency, which it foresees; rendering not only fæcal extravasation from gangrene, in these cases, exceptional, if not unknown, but the practice of mechanically fixing the edges of the divided bowel unnecessary, and even wrong. For the primary object for which such practice is generally adopted, having been shown to be needless, nature's processes having forestalled man's inventions, it remains for us only to reflect that in the second stage of artificial anus, that is, when the fears of extravasation, &c., have passed away, and the fact that the divided bowel and the sac's neck are firmly glued together is established, that this very retraction is the process by which any cure can be expected; for by it the ends of the divided bowel, with the retracting neck of the sac to which they are adherent, forms that temporary channel through which the intestinal fluids find their way to the lower bowel, and thus allow time for the other operations of nature to perfect a cure. Any interference, then, to such a process, cannot but be regarded as improper; and undoubtedly the ligaturing of the bowel's edges to the integuments must come under such a heading. For it is clear, if the necessary amount of retraction in the most favourable cases is but just sufficient to allow a cure, that the required portion of internal retraction must be almost entirely prevented, where the integuments and external coverings form the boundary, and with it the resistance. It is true that these assist well to form a firm and direct channel for the conduction of the fæces externally; but this very truth is an extra argument against the practice; for what hope can be entertained of a cure, when the bowel is, as it were, everted, and the traction has been exerted from without instead of from within. It may be said, however, that the practice forms an increased security, and the chances of recovery, in artificial anus, being so slight, that it outweighs in the balance any objections against it. But to such reasoning it must be answered, that where security exists, extra security is not wanted;

and that the fact that recovery from such cases of artificial anus does take place, should totally prevent the surgeon from pursuing a practice which excludes all hope of such a result, and at the best can only prolong a life which is generally a burden, and undoubtedly a misery to the patient and those around him.

5. With regard to the great question of opening or not opening the sac in hernia, the conclusions have a decided tendency towards the latter operation, although more, perhaps, by negative than positive evidence.

Not entering upon the mere question of per centage recoveries, as compared in the two operations—so many extra circumstances separately influencing the termination of a case, besides the question of opening or not opening the sac—the present materials will only lead me to examine into the truth of the dangers by which the advocates of the former method believe the more lenient operation to be surrounded. And summed up into two heads, the fear of returning a ruptured or gangrenous intestine into the abdomen, or of a bowel strangulated by the sac's contents, include the principal, if not the only dangers. That such accidents may happen there is no doubt; but whether they are more liable to occur in such cases as may require an operation, than in cases where a line of practice is adopted which all agree upon as being the first means to be employed, namely, the taxis, is not so certain. To return a gangrenous bowel into the abdomen either by the taxis, without dividing the stricture, or with doing so, is not easy. The accompanying inflammatory action not only always glueing the gangrenous intestine to the sac's mouth, but very frequently to the sac itself; thus rendering the application of the taxis in both its modifications perfectly useless. Here, then, the opening of the sac is called into requisition. But why, as a rule, do more than is required at an operation, because exceptional cases may occur, in which some fancied or real mischief may follow the simpler means? By the same argument, the taxis itself would be abolished, and herniotomy always be employed; for, undoubtedly, the former has produced more mischief, as a whole, than any operation, whether of opening or not opening the sac. But if this fancied mischief can be shown to be groundless, and if it can be shown to be probable that on the gangrenous bowel being returned, little or no evil is likely to result, the argument against such a practice falls to the ground, and, as a sequence, the milder operation is supported. Such a truth the materials of this paper seem to ratify; for in no one case of gangrenous bowel did extravasation occur, and in all, the intestine was glued to the sac's mouth. In many cases the bowel subsequently sloughed, but in all artificial anus followed; and in one instance, which made great impression at the time, the sac was *not* opened, the intestine was returned to its position at the sac's mouth, subsequent sloughing followed, the sac easily gave way, and artificial anus was established; showing, at least, in one case, the leaving of the sac

unopened was certainly not disadvantageous. In all the deaths related, not one case is numbered, where the opening or not opening the sac would have been a point of any importance. In the cases of gangrened bowel, it has been shown that no evil was the result of its return; but in conclusion 15 it is rendered probable, that the return of the gangrened bowel into the abdomen, and the leaving to nature the mode of establishing an artificial anus, was of a decidedly beneficial character. For it is certain, that in those cases where such a result followed the surgeon's interference, death followed *more* rapidly than where the process was left to nature. In the former cases, it may be said that such a result would be expected, as they were evidently of a worse character, or else such interference as opening the bowel would not have been deemed necessary. But such a conclusion is hardly just; for, as the danger of a strangulated hernia depends upon the obstruction to the intestine, and as that obstruction exists as surely from a gangrenous bowel within the abdomen as one within a hernial sac, and as relief in both first consists in the establishment of an external outlet till such an end ensues, the mechanical obstruction still exists, and both classes of cases are in an equal position. And as it has been shown that life is longer when nature's processes bring about this result, the advantages of returning a gangrenous bowel to the sac's mouth cannot be denied.

6. What, then, are the conditions of intestine where its return would not be advantageous? is a question which naturally follows; and with all due deference to the opinions of others, and with diffidence in making known my own, the force of evidence compels me to the conclusion, that in only one condition can such practice be deemed advisable, and that is where the bowel is decidedly ruptured. When gangrenous only, the neck of the sac has been shown to be its right position, in any other more favourable condition no one will dispute the practice of reducing it. But when ruptured, I would say leave it in its place, return any unaffected bowel if present, but leave the ruptured portion. And as the "let alone" practice seems most favourable, even then, perhaps, it may be employed with benefit, and the bowel left for nature to open further. Here, then, research and analytic evidence come forward to support an opinion stated to the author by his late respected teacher, Mr. Aston Key, who startled him with the then strange opinion, "that in all conditions of the intestines the abdomen was their right place." That such a rule is right, excepting in case of rupture or perforation of the intestine, the force of the evidence compels me to admit; and although not expecting others altogether to agree, still, as the object in starting was fairly to express the results which the materials, together with much careful reflection, have enabled me to bring out, I leave them, with all deference, to the kind judgment of those who consider these pages worth perusing.—*Guy's Hospital Reports*, 1856, *p.* 83.

63.—ON THE DIFFICULTIES OF HERNIA.

By Alfred Baker, Esq., Surgeon to the Birmingham General Hospital.

A point of some interest is connected with the reduction of the hernia without opening the sac. This procedure, first advised by Petit a century ago, has recently been much advocated, especially by Mr. Luke. Unfortunately, it is not always easy of accomplishment. In several cases in which I have attempted it, the adhesion of the neck of the sac to the tendinous aperture through which it had escaped, has been so intimate, as to preclude even the insertion of my nail ; and I have thence been compelled to open the sac. My experience of the practice would lead me to pursue it whenever the hernia was recently strangulated ; when the general symptoms, and the appearance of the sac as exposed by the knife, did not indicate those morbid changes peculiar to the advanced stages of strangulation. The dangers which may result from penetration of the peritoneal cavity are *de facto* avoided, and the cure of the wound in the superficial textures is, according to my experience, much more rapid.

When, however, the hernia has been strangulated for some days, and when the symptoms have been sufficiently acute to lead us to suspect that structural changes have occurred in the displaced parts, it is better always to open the sac, and examine the protruded viscera, instead of returning them blindly into the abdominal cavity by a division of the stricture external to the sac.

Other objections also may be urged to the general adoption of Petit's recommendation. Cases are related by different authors in which the seat of stricture was neither at the abdominal ring, nor the neck of the sac ; but where the compressing agent was a circular band of adventitious membrane, the result of local peritonitis, that tightly embraced the loop of intestine at a point corresponding with the neck of the sac. In such cases the nature of the stricture cannot be appreciated without opening the sac ; and relief is impossible unless the band is divided. Pirrie, in his work on surgery, relates four cases of this kind, in one of which he discovered the source of constriction, and liberated the bowel. Instances of strangulation of bowel by an aperture in the omentum have been recorded.

Intestinal Obstruction : Irreducible Hernia with no Strangulation. Sarah Wine, aged 59 years, a short fat woman, was admitted into the General Hospital, on the 22nd of September, 1842, at five P.M., with an irreducible umbilical hernia, and symptoms of obstructed bowels of four days continuance. She has been under medical treatment, but the severity of the disorder has increased.

Present State. Her face is sunken and anxious ; surface cool ; breathing hurried ; pulse small, frequent, and feeble ; constipation for the last four days, with constant vomiting of brownish mucus and watery fluid ; and occasional hiccough. The abdomen is uniformly

tender, rather tense and tumid ; it is dull on percussion, except in the left iliac region, where slight resonance is observed. A tumour as large as a melon, of eighteen years standing, occupies the umbilical region, which receives impulse on coughing, and appears to be partly solid and partly fluid. Close to the navel the swelling is elastic, channeled as though from convoluted intestine, and the skin is empurpled and semi-transparent ; below it is solid, and has a doughy feel. The integument covering it is loose and flaccid, and has not the smoothness and tension usually met with when hernia is strangulated. The upper portion diminishes slightly in bulk under the use of the taxis, but the lower remains quite unaltered. It being ascertained that no stricture existed in the rectum within reach of the finger, O'Beirne's tube was passed for eight inches, when it was arrested, and cold water was then injected ; but the fluid returned immediately without a trace of fæcal matter. The precise seat of obstruction being regarded as uncertain, the usual remedies being known to have produced no relief, and it being possible that strangulation might be maintained in the hernia without giving rise to much tension or tenderness in the tumour, it was determined to open the sac. The walls were thin, and in parts translucent. On opening the pouch, a little clear serum escaped. The contents were found to be a piece of large intestine, apparently transverse colon, covered by omentum ; both were healthy, and free from congestive discoloration ; and both were adherent to the ring on the right side by false membrane. The reducible portion of the bowel was pushed back into the abdomen, and the remainder, with the omentum, left in the sac.

After the operation, enemata and other remedies were administered, but the obstruction continued, and became accompanied with symptoms of peritonitis. The patient was brought under the influence of mercury ; croton oil was given internally, and rubbed over the abdomen externally ; and in two days after her admission the bowels began to act freely. All the urgent signs gradually subsided, and in about three weeks she left the hospital quite well, being supplied with a concave truss for supporting the hernia.

The opening of a herniary sac, the contents of which are free from strangulation, may not be very rare ; but I have brought the foregoing case forward to show one of the difficulties which beset the surgeon. All the symptoms were explicable upon the supposition of the hernia being strangulated ; the absence of tension from the tumour did not disprove the existence of constriction ; since in old and large herniæ there is ofttimes no tenseness of the sac, until inflammation has attacked it.

[The following rules on the treatment of the omentum are not unworthy some degree of attention :—]

1. When the omentum has been recently protruded, is simply congested without further structural change, and has formed no adhe-

sions to the sac, or such soft and slight ones as can be broken down with the finger or the handle of a scalpel, it should be replaced in the abdomen.

2. When the omental protrusion is of old standing ; when its texture is thickened by adventitious deposit, or condensed by pressure ; it should be left in the sac, in the hope that the inflammatory action which follows herniotomy will agglutinate it to the neck of the sac, and thus form a barrier against the re-descent of the hernia. Its return into the abdomen, if thus structurally changed, must expose the patient to the risk of peritoneal irritation. Its retention in the sac has never been followed within my experience by any evil effects, and I have seen this treatment adopted in numerous cases. Suppuration of the sac has followed in several instances, but I have never observed any colic or dragging pains to indicate the impropriety of the practice. Considering that omentum, thus altered in structure, must, of necessity, have been long displaced from its natural relation to the abdominal viscera, I can scarcely suppose that serious inconvenience could result from its being allowed to remain in its new position. After the external wound has healed, the only precaution necessary is to apply a well-fitting truss with a hollow pad instead of the ordinary convex one. Lawrence seems to think that leaving the omentum in the wound presents no particular advantages, but that it exposes the patient to the possibility of ill consequences from injury, inflammation, or disease. The experience of Hey, Chopart, and Desault, now strengthened by other surgeons, proves the success of the method, and shows that omentum thus left either recedes gradually into the cavity of the belly, or becomes atrophied. All chance of injury is obviated by the hollow truss.

3. If firm, organised, and general adhesions exist between the omentum and sac, the same law holds good. The abdominal viscera have, in such cases, become gradually accustomed to their changed relations, and would be liable to disturbance of function by a sudden and perhaps violent restoration to their normal position. I need scarcely advert to the slowness and care with which a dissection of omentum from the hernial sac must be effected, the danger of all protracted operations, and the especial risk of injury to which a prolongation of the largest serous membrane in the body is exposed by such a procedure, to enforce the importance of this rule.

4. When omentum is the seat of sphacelus, the dead portion should be separated by a clean incision, and every bleeding vessel secured by a ligature. In recent cases, where the return of omentum into the peritoneal cavity is determined upon, the ligatures should be cut short off, and great care must be taken to remove every portion of gangrenous tissue. If the omentum be thickened as well as devitalised, Macfarlane's plan of returning it into the abdomen should not be followed ; the dead part should be removed, bleeding vessels tied, one end of each ligature being brought out through the wound,

and the remainder of the mass should be pushed back so as to occupy the internal ring, and thus to form a natural pad, whereby the aperture may be closed. In no case should the cut extremity of the omentum be included in one strong ligature, a practice which has been pursued by some surgeons. The process by which ligatures are detached from living textures is apt, under such conditions, to run on into spreading inflammation, and perhaps gangrene ; the constriction of the omentum may keep up the symptoms of strangulation, and the least evil that can happen is a tolerably certain one, namely, suppuration and sloughing in the sac.—*Association Medical Journal, July* 19 *and* 26, 1856, *pp.* 601, 621.

64.—CASE OF PSEUDO-STRANGULATED SCROTAL HERNIA.

By D. Kelly, Esq., Mullingar.

[W. G., aged 35, has had scrotal hernia for eight or ten years, for which he has worn a truss, but being rather careless, he sometimes went without it, as on the day of the present attack. He states that on Sept. 22, he was engaged with his boat, when the bowel suddenly came down, accompanied with severe pain. He attempted to reduce it, as usual, but failed. He went home to bed, passed the night in agony, which continued the next day, when thirst and vomiting set in about 3 p.m. On the following day he was persuaded to send for Mr. Kelly, who says]

24th. I found him lying on his back ; knees drawn up, countenance collapsed, wild looking, and expressive of great anguish ; eyes sunken, and surrounded by a leaden-coloured areola ; incessant thirst, constant vomiting, the smallest quantity of fluid invariably rejected in a few minutes ; hiccup : pulse almost imperceptible ; extremities cold ; no abdominal tenderness, but intense pain in the pit of the stomach at times, and in the seat of the hernia continually.

I found the scrotum enormously distended, hard, tense as a foot-ball, dusky red, shining, and so exquisitely tender that not the slightest manipulation of any sort could be had recourse to, the mere attempt even being impossible from the nervous fears of the poor patient, who quite unconsciously pulled his legs further upwards, closed his knees, and completely covered the distended scrotum with both hands, accompanying the action by an expression of intense agony and fear directly any one even removed the clothes to look at it.

Fearing from its shining, dusky red appearance, coupled with the severity of the other symptoms, that not only was strangulation proper to be feared, but that gangrene also was most likely to ensue, I informed his friends of his great danger, and as, under such circumstances, any attempt to free the bowels would be not only useless but productive of unnecessary suffering, and as the pain under which he laboured was not only intense but incessant, and required immediate

relief, I gave him two grains* of acetate of morphia at once, had a dozen leeches applied to the scrotum, and got him into a warm hip bath directly they dropped off.

Saw him again in two hours, and found him if anything relieved; leech bites still bleeding; pulse just perceptibly improved; countenance less anxious, but no decrease as yet either in the tenseness of the tumour, the tenderness, or the redness; desired two grains more of the acetate to be given then, and one grain every second hour till bed time, and to have another hip-bath immediately before.

Ten, p.m. Retching all but gone; pulse improving; dozed for about an hour since I last saw him; scrotal tenderness considerably less; redness disappearing, yet the swelling and tension as yet unabated, and he still complains of considerable pain in the seat of the hernia on the slightest motion, still covering it with his hands, and looking most beseechingly at you directly you attempt to approach it; countenance much improved, and on the whole more hopeful; directed the acetate to be continued every two hours, or until relief was obtained or he fell asleep.

25th, eight a.m. Took five grains of the acetate during the night without producing absolute sleep, but felt quite composed, quite free from restlessness, and dozed occasionally.

About four a.m. all pain disappeared from the scrotum, and sometime after, having mustered up sufficient resolution to make the examination himself, he ascertained the tenderness also was so greatly decreased that he could make almost any amount of pressure on it without being productive of pain.

On examining it I found it still hard, still apparently as large, but not entirely so tense as yesterday, and beginning to assume something of its normal and rugose character; redness quite gone, and tenderness so inappreciable that I attempted reduction, but did not persist, as I seemed to make no impression just then, and I feared to reproduce irritation, and as the morphia agreed so well, and did not narcotise him, I directed him to continue it every third hour till my next visit.

On my next visit he felt so much improved, and so perfectly free from pain, irritation, or tenderness of any sort, that I again had recourse to the taxis, and after a few minutes' gentle manipulation, in which I was encouraged to persist by the occasional occurrence of a rumble in the tumour, I had the satisfaction of feeling the contained viscera suddenly recede before my fingers, rush through the constriction, and resume their normal position, accompanied by the peculiar loud gurgle indicative of so fortunate a consummation.

I then directed him to remain at rest till evening, when he should have a dose of oil, for although his bowels were not freed since the preceding Saturday, yet I feared interfering with the quiet of viscera,

*[We think there must be some mistake about the very large doses of morphia mentioned in this paper, and would caution our readers on this subject.—Ed. *Retrospect.*]

just then recovering from the irritation produced by such long-continued incarceration.

26th. Bowels had been opened early in the morning by the oil, since which period he feels quite well; wishes to get up and have his breakfast, remarking he did not at all feel weak, an assertion which he put to the test of experiment in my presence by bounding out of bed with a degree of suddenness and energy quite in keeping with his character, and which really made me shudder for his hernia, but most fortunately without realising my anticipations.

April 2nd, 1856. Having again, through his hurry and carelessness, forgotten to put on his truss, and besides eaten, or rather bolted, a hearty breakfast of very fresh bread and tea, and exercised himself most violently immediately after, he was seized, about one p.m., with the usual symptoms of incarceration, of which nausea and pain in the pit of the stomach were the most urgent.

To these succeeded vomiting, pain in the seat of the stricture, with tenseness, swelling, and soreness in the scrotum.

Having made repeated attempts, early in the afternoon, at reduction, but unsuccessfully, and which he finally abandoned through the increasing tenderness in the hernia, he at length again sent for me about five p.m., when I found all the symptoms of incarceration or pseudo-strangulation fully developed, accompanied by the same half wild look of agony, and the same unconscious efforts to prevent any, even the most superficial examination, as when I first saw him in September.

I directed him to have two grains of acetate of morphia immediately, and repeat it in two hours, and to get into a warm hip bath at once.

Saw him again at 8 p.m., when I found he was not exactly so uneasy as at my first visit, but that the scrotum was still excessively sensitive, and as tense, if not more so, than when I last saw him.

Got him again into a hip bath, and ordered him a grain of the acetate every two hours, till morning, provided he remained awake.

Wednesday 4th, 8 a.m. Being, amongst his other accomplishments, a profound politician, I found him, on my arrival, reading the 'Daily Express,' and supposing from the *abandon* of his position, and the *sang froid* of his remarks on the affairs of the East and the imperial baby, that he must have reduced his hernia, I was astonished to find it was still exactly in *statu quo*.

He informed me, however, that he was quite free from pain or uneasiness of any sort since twelve o'clock; and that although he did not sleep, yet he felt quite composed, and had no particular desire or anxiety on the subject.

Examining the state of the scrotum, I found it fully as large as the evening before, but it was quite free from pain, and could bear any amount of handling. I therefore had recourse to the taxis, felt some rumbles as before, and after a few minutes' manipulation, reduced the viscera without the slightest difficulty.

Making every allowance for idiosyncracy, this is a most interesting and instructive case,—interesting in confirming, so far as it goes, the opinion of M. Malgaigne, and instructive, as showing the efficacy of a treatment but so lately introduced into practice.

The old doctrine of strangulation, as enunciated by Boyer, and still deemed heretical to doubt by many members of the profession, has been called in question by M. Malgaigne, who enunciates, "that what is generally considered as strangulation, is but the unknown peritonitis of hernia that has been treated, and very badly, under that name.

"This peritonitis, however, scarcely mentioned *en passant* by the most modern authors, is the most frequent accident to which herniæ are liable, and it has probably been overlooked because hernia has not been sufficiently studied by surgeons in its simple state.

"This inflammation is of two kinds—the adhesive and the suppurative; the former is often slight, is revealed by colic more or less acute, &c., or may go so far as to excite vomiting, hiccup, &c., as real strangulation would do.

"The hernia is then irreducible, the taxis only aggravates the symptoms, and yet in this condition of things confinement to bed, and cold or warm topical applications frequently suffice to effect the reduction."

He also comes to the conclusion, from the examination of more than three thousand cases of hernia of every size, and in almost every variety of subject, that neither strangulation, nor pseudo-strangulation, can be ever dependent on obstruction proper, or the accumulation of hardened fæces in the hernia.

Professor Williams, in allusion to the same subject, in a case brought brought by him before the Surgical Society of Ireland, in 1841, says—"This had clearly been a case of inflamed hernia, and not a case of strangulation, and bore out, so far as a single case could do, the opinion of M. Malgaigne.

"After the operation, it was found the protruded bowel could not be returned till pressure was exerted on it for at least two minutes. the obstacle to the reduction consisting in the condition of the intestine itself, which was rigid and unyielding from the thick layer of coagulable lymph with which its surface was covered.

"It was considered, however, necessary to return it, as it gave the sensation to the touch (afterwards found to be erroneous) of containing some indurated mass supposed to be fæces in its cavity.

"On dissection, the coats of the portion of intestine that had been protruded (the ilium about twelve inches from its termination) were found to be enormously thickened, in some parts fully to the extent of a quarter of an inch.

"The proper tissues of the bowel were not hypertrophied, the thickening depended on the effusion of coagulable lymph, partly situated on the serous surface of the intestine, partly in the subserous cellular tissue.

"In consequence of this condition of things, the calibre of the intestine was diminished to less than a fourth of its natural capacity, and it was the deceptive sensation thereby communicated to the touch which led to the belief that indurated faces were impacted in the bowels."

Having those opinions before me, then, instead of considering it as a true case of strangulation, every symptom of which, as laid down by the best authorities, it appeared to exhibit, I was inclined to suppose it one of pseudo-strangulation, or acute peritonitis of the hernial sac.

Already having tested the efficacy of large doses of opium in peritonitis, and taking into account the high authority by whom it is recommended, I felt no hesitation whatever about either the full dose or the treatment, however I might about the exact nature of the complaint, being determined to watch its effects, and be guided by circumstances as to the extent to which I could push it with safety.

I therefore decided on giving it a fair trial, conjointly with topical bleeding and warm bathing, in which plan I was the more confirmed as I knew that were it even a veritable case of strangulation, my poor patient could never be induced to submit to an operation for its reduction involving the use of a cutting instrument.

And it is now, indeed a source of the greatest satisfaction to me that I have been guided by the opinion of such high authorites in medicine and surgery, both as to my diagnosis and treatment, and the more especially as the second incarceration was a sort of *experimentum crucis* of the soundness of the one, and the efficacy of the other; full doses of morphia cutting short in a few hours an attack exactly the analogue of the preceding in suddeness, and severity of seizure, the commemorative history of which extended over a period of three whole days of incessant and excruciating agony.

I therefore think I may presume that this case goes, so far as an isolated one can, to recommend the adoption of opium by the profession, before the "ultima ratio," an operation (which statistics prove to say the best for it, to be exceedingly doubtful, indeed), should be resorted to in cases supposed to be those of strangulation.

I cannot conclude, however, without observing, I should be guilty of an act of gross injustice if I omitted acknowledging my obligations to some gentleman, whose name I cannot just now call to mind, or even the publication in which his case appeared, and who, I believe, was one of the first to give large doses of opium in a supposed case of strangulated hernia, and successfully. I regret that I have been so excessively stupid as to have forgotten his name, and hope that should this publication meet his eye, he may be induced to republish his case or cases, should he have more than one, as it was the recollection of his success which chiefly influenced me in the adoption of a treatment, not only so satisfactory in my hands, but also one that has common sense, together with its simplicity, to recommend it to the notice of the profession.

The foregoing paper having been written before that of Dr. Nicolls of Longford had appeared, I am indeed most happy to have such additional proof of the efficacy of opium in so many cases of pseudo-strangulation, presenting, as they do, such a fearful combination of symptoms, and at times terminating so unfavourably; and I trust this sentence will account for what he otherwise might consider a piece of wilful neglect on my part in not alluding, in this paper, to his truly graphic, interesting, and instructive cases.

I must say, however, that I differ from him a little in my views of such cases, as I imagine the most perfect degree of rest of the bowels absolutely necessary for the success of the opium treatment, a state only obtainable by having recourse to no interference whatever having any tendency to excite their peristaltic action.

And in this view I am only following in the wake of the most eminent authorities of the present day, who in their *clinique* have advocated, and in their practice have pursued, such treatment in peritonitis, and who have founded their advocacy on the assumption that nature, in such cases, induces a partial paralysis of the muscular coat of the bowels for the purpose of keeping the inflamed peritoneum in a state of quiescence.—*Dublin Hospital Gazette, July* 15, 1856, *p.* 183.

65.—*On the use of Opium in Strangulated Hernia.* By Dr. Simon Nicolls, Surgeon to the Longford Workhouse.—[The following cases show the great assistance which may sometimes be derived from opium in strangulated hernia. Case 1, is that of a man to whom Dr. Nicolls was called in consultation, the hernia had been down from early in the morning and was very tender; it was then 10 P.M., and it was considered best to put the man under the influence of opium and wait until they would have better convenience and assistance for the operation.]

I candidly admit that it was with the view of borrowing time, and keeping the man quiet until morning, that I ordered six grains of opium in three pills, one every third hour until sleep would be produced. I parted from Mr. Campbell with the understanding that we were to visit our patient at 8 next morning, or sooner if symptoms became more urgent. At the appointed time we saw Nowlan, who was in a sound sleep, having taken two pills during the night. When he awoke we found that the hernia had disappeared; it had receded of itself. This caused me to consider strangulation in the great majority of cases to be more the result of spasm than of permanent stricture.

Case 2. 1847, December 25th, at 2 A.M., I was called to see Mr. B., a respectable farmer residing five miles from this town. On my arrival I found him suffering very much from strangulated hernia, which he informed me had descended in the middle of the day previous while in town on business; I tried the taxis, and not succeeding gave him 60 minims of tincture of opium. I then tried a smart purgative injec-

tion, with hot and cold stupes alternately, and repeated the taxis and injections frequently during the night, without success.

At 8 A.M., having to see a gentleman seven miles from town, in an opposite direction, I gave him a second draught of equal strength with the former, promising to be back early, leaving my instruments to convince him that if he was not better on my return I would operate. It was 8 P.M., when I got to Mr. B.'s; he was in a profound sleep; I awoke him, when, to my great satisfaction, and that of Mr. B. also, the hernia disappeared, with but very slight exertion on my part. I got him one of L'Estrange's trusses, and never since heard of his having had a return of his hernia.

Case 3. 1855, May 5th, about 5 P.M., I was called to see A. R., a small farmer residing three miles from this town, who had been from the previous evening suffering from strangulated hernia; not succeeding with the taxis, I gave him 80 minims of tincture of opium, and anxious to have my patient all right before night, I taxed my ingenuity to make the most of the little daylight that remained. I got a quilt spread on the floor along his bed, on which I rested his head and shoulders, his hips only resting on the side of the bed, his thighs and legs being flexed on his abdomen; had cloths out of cold spring water applied to the tumour, and an enema administered. I then gave him some lint, wet with chloroform, to inhale, and when he appeared to be slightly under its influence, I resumed the taxis with success. In my hospital practice, if I cannot at once succeed with the taxis, I give a full opiate, return in four or six hours according to circumstances, and then frequently succeed in reducing the hernia.—*Dublin Hospital Gazette, May* 1, 1856, *p.* 102.

66.—ON THE "EXPIRATORY METHOD" OF PERFORMING THE TAXIS TO EFFECT THE REDUCTION OF HERNIA.

By Dr. ANDREW BUCHANAN, Professor of the Institutes of Medicine, University of Glasgow.

[This method is a modification of the ordinary manual operation for the reduction of hernia.]

The peculiarity of the method consists in this, that just before the force is applied, the patient is directed to make a very full expiration, and thereafter to refrain as long as possible from making a fresh inspiration; or, as it is more intelligibly expressed to the uninitiated, he is directed to blow as much air out of his mouth as he possibly can, and to continue thereafter as long as he can without drawing a fresh breath. While this is going on, the operator, having made all necessary preliminary arrangements, attempts to return the hernia, beginning as soon as the expiration is a little advanced, and continuing his efforts gently but steadily during the whole period of suspended respiration.

When the patient is at length compelled to draw a fresh breath, the pressure should be relaxed, so as not to oppose the force of the muscles of inspiration; but it should not be altogether given up, and as soon as the patient is a little recruited from his exhaustion, he is made to perform another expiration, and so the operation is continued as long as may be required. The first indication of success, consisting in a slight internal motion or gurgling noise in the tumor, almost universally occurs during the suspension of the breathing, and it is during the same period that the complete return of the hernia is usually effected.

There are some important minor details in the operation which depend on the intelligence and strength of mind of the patient. If he possess both those mental qualities in a sufficient degree, he will be able, after making the full expiration, to refrain from inspiring by a voluntary effort. Such cases are the most favourable for the success of the operation. In other cases, and these cases occur more especially among females, the patient understands and acts fully upon the direction of blowing out the breath, but wants strength of mind for the subsequent control over the inspiratory muscles. In all such cases it is indispensable to have an assistant whose duty it is, as soon as the expiration is completed, to apply his hands over the mouth and nose of the patient, so as to prevent inspiration for as long a period as may be deemed safe and advisable. If, however, the lungs can be sufficiently emptied, such cases are little less favourable than the former. Last of all, there are persons who, whether from natural stupidity or from fright and confusion of mind arising from the condition in which they are placed, cannot be made to comprehend and follow out the directions given them. In those cases the lungs are never emptied to the necessary degree, and the success of the operation is proportionally uncertain.

The theory of this operation is simple. In the first place, it disassociates the diaphragm from the abdominal muscles, and, by preventing them from acting in concert, removes the chief obstacle to the reduction of hernia. Secondly, it weakens the muscular power of the body, and diverts it from the act of resistance.

It is the simultaneous contraction of the diaphragm and abdominal muscles which enables the patient to press down and resist the efforts made to return the hernia. This is one of the most important combinations of muscular action in the whole animal economy. It constitutes the *nixus* of physiologists. Acting in the natural way, it forces out the contents of the bowels, of the urinary bladder, and of the uterus, according to the direction given to it: and when misdirected, it becomes the principal cause of the production of hernia, forcing out the bowels themselves where the walls of the abdomen are least able to resist the pressure; while it becomes also, after the disease has been once produced, the force which opposes the return of the hernia into the cavity of the abdomen. Now, it is quite indispensable to the ex-

istence of this force, that the diaphragm act as well as the abdominal muscles, and the moment the diaphragm is relaxed the force is necessarily destroyed. The intention of the instructions given to the patient before proceeding to the taxis will, therefore, be at once apparent. Expressed in other terms, those instructions just amount to this—"relax your diaphragm, and keep it in a state of relaxation;" for there is no mode of relaxing the diaphragm, but by making an expiration, nor any mode of keeping the diaphragm relaxed, but by refraining thereafter from breathing.

In so far as the general muscular system is concerned, the mode of proceeding here recommended is not confined to the application made of it, but might be successfully employed in facilitating the reduction of dislocations, or counteracting any other muscular resistance. The state of expiration and the suspended breathing which follows it, produce rapidly an overwhelming sense of debility over the whole body, which paralyzes all muscular exertion. These conditions of the respiratory organs not only produce a positive, but also a negative effect of an useful kind; for they prevent full inspiration, and the *nixus* of which it constitutes a part. Now that act, by giving fixity to the trunk of the body, and a firm point of support to the muscles thence arising, is an indispensable preliminary to every vigorous muscular effort, and of course to every act of resistance. Last of all, there is no feeling more absorbing than that produced by a want of breath, whether kept up voluntarily or enforced, and the diversion of the patient's mind from the hernia so produced, operates just like the well-known expedients employed in cases of dislocation to facilitate reduction.—*Glasgow Med. Journal, July*, 1856, *p.* 180.

67.—NEW MODE OF REDUCING STRANGULATED HERNIA.

By Baron Seutin.

Baron Seutin declares. that with his mode of reducing strangulated hernia, which he has now practised for twenty years, he hardly ever in his large practice finds it necessary to have recourse to an operation.

The patient is laid upon his back, with the pelvis raised much higher than the shoulders, in order that the intestinal mass may exert traction upon the herniated portion. The knees are flexed, and the body is slightly turned to the opposite side to that on which the hernia exists. The surgeon ascertains that the hernia, habitually reducible, cannot be returned by continuous and moderate taxis. He next seeks with his index finger for the aperture that has given issue to the hernia, pushing up the skin sufficiently from below, in order not to be arrested by its resistance. The extremity of the finger is passed slowly in between the viscera and the herniary orifice, depressing the intestine or omentum with the pulp of the finger. This stage of the procedure demands perseverance, for at first it seems impos-

sible to succeed. The finger is next to be curved as a hook, and sufficient traction exerted on the ring to rupture some of the fibres, giving rise to a cracking very sensible to the finger, and sometimes to the ear. When this characteristic crack is not produced, the fibres must be submitted to a continuous forced extension, which, by distending them beyond the agency of their natural elasticity, generally terminates the strangulation. This mode of procedure is more applicable to Gimbernat's ligament, the hooking and tearing of which are more difficult than in the case of the inguinal ring. Considerable strength has sometimes to be exerted, and the index finger becomes much fatigued. When, in consequence of the narrowness of the ring, the finger does not at once penetrate, it is to be pressed firmly against the fibrous edge, and inclined towards the hernia. After a time the fibres yield and the finger passes. When the finger becomes fatigued it is not to be withdrawn, but it should be supported by the fingers of an intelligent assistant, who seconds the action it is desired to produce. In inguinal hernia, the traction should not be exerted with the finger upon Poupart's ligament, but in a direction from within outwards, and from below upwards, by which the aponeurotic layers between the two ligamentous pillars constituting the inguinal aperture are easily torn through.

The ring is then enlarged by this tearing, just as if it had been divided by a cutting instrument, or largely dilated, and reduction takes place easily, by performing the taxis in a suitable direction. The mobility of the skin, its laxity in parts where hernia prevails, and its extensibility, greater in proportion to its thinness and to the absence of a lining of fatty cellular tissue—by allowing the sliding and the thrusting of this membrane in front of the finger it cushions, affords protection to the intestine from all immediate contusion. When the strangulation is induced by the issue of a considerable mass of intestine, or an accumulation of fæcal matters, it is desirable first to disengage one of the extremities of the noose, and to seek to expel the gas or fæcal matters by moderate pressure, in order to facilitate the reduction of the tumour. In the few cases in which the finger cannot be introduced, a small incision may be practised in the skin, and the handle of a spatula or any blunt instrument may be passed in by separating the cellular tissue. Pressing this against the border of the ring, while avoiding the intestine, this orifice may be eroded or dilated without danger. The greater the resistance offered by the aponeurotic fibres, the greater will be their tension, and the more easily will their laceration be produced.

As a general conclusion, it may be laid down, that the facility and promptitude of this procedure, and the immunity that attends it, ought to diminish the gravity of the prognosis of strangulated hernia, by rendering the circumstances under which recourse need be had to an operation quite exceptional. Such exceptional cases will be found (1) in old, irreducible hernia. (2) When the strangulation in inguinal

hernia occurs at the internal ring. Generally the external ring and inguinal canal are large, and allow of the easy penetration of the finger; and then the new method is applicable, and the rupturing or dilatation of the internal ring should be attempted, and the manœuvre is rendered the easier by the fact, that in these cases the canal is much shortened, and the two rings much approximated. If, however, the external ring is too narrow to admit the finger, an operation is required. (3) When there are general symptoms of a gangrenous state of the intestine.—*Brit. and For. Med. Review, July* 1856, *p.* 259.

68.—*On Opening the Sac in Hernia.*—It is very remarkable how widely surgeons of the very first eminence differ on the question of operation with or without opening the sac. Two of the chief surgeons of the two Borough hospitals lately met together in Guy's, at the bedside of a hernia patient. One surgeon said he would not think of operating without opening the sac; to which the Guy's surgeon replied, that he could not see how his friend could even use the taxis, or return the intestine at all, without opening the sac, and seeing it; for the operation was only intended to assist the taxis. To this the St. Thomas's surgeon answered, that he thought all or a great deal of the fatality of hernia cases arose from abuse of the taxis, and a very great deal from not opening the sac, but returning mortified intestine; and that, as far as his experience went, backed by that of St. Geoge's Hospital, Charing Cross, and others, he would in all cases open the sac early. That was the chief, if not the only point: *it would do no harm if the intestine were sound;* it would save many lives, if it were not sound, which are now sacrificed to a theory, and some imperfect statistics. The age of patients is perhaps the only other element of essential moment.—*Association Med. Journal, March* 8, 1856, *p.* 185.

69.—ON INTERNAL HEMORRHOIDS.

By T. J. Ashton, Esq., Surgeon to the Blenheim Street Dispensary.

[In the less severe forms of internal hemorrhoids constitutional treatment will succeed in entirely removing all inconvenience and suffering; but other cases are often met with which are not so easily relieved, and which demand surgical interference. In such cases Mr. Ashton says:]

Before proceeding to operate, it is most important that the constitutional cause, whatever it may be, should be removed or palliated, that febrile action be subdued by the administration of suitable remedies, that attention should be paid to the proper performance of the functions of the liver, skin, and kidneys, and that the colon be freed of fæcal accumulations. The bowels should be freely relieved by an aperient and an enema some hours previous to the operation, so that they may not require to be moved for two or three days afterwards. It is

to the neglect of these preliminary and most essential measures that the failures and sufferings mentioned by some surgeons are due, or to the unhappy selection of the cases, and operating when the local disease, or the state of the constitution, or presence of serious organic visceral disease, rendered surgical interference unadvisable and improper. For the removal of internal hemorrhoids, either strangulation of the tumours by means of the ligature, or the application of strong nitric acid, as suggested by Dr. Houston in the twenty-third volume of the 'Dublin Journal,' may be had recourse to. When the hemorrhoidal tumours present a florid, granular surface, and do not project much above the surrounding mucous membrane, the application of nitric acid is the better mode of treating them; but when they are large, pendulous, or indurated, either from their original character, or from the effects of repeated inflammation, the ligature ought to be used, and is entirely free from danger, provided the precautions previously insisted on have been attended to.

Internal hemorrhoids, preceded by dysentery; great loss of blood; stricture of urethra. Hemorrhoids treated with nitric acid.—Major J——, a tall, fine man, of a naturally good constitution, but impaired by a long residence in India and active military service; had suffered several times from dysentery; for seven years had had piles, frequently lost considerable quantities of blood, the bleeding at times continuing for half an hour; defecation was always attended with pain and much straining, the pain being aggravated when the fæces were bulky and indurated; the bowel slightly descended at stool, but returned by muscular contraction. He had had various remedies prescribed, as lenitive electuary and sulphur, copaiba, Ward's paste, &c., but without benefit. No examination of the bowel had been made by the several surgeons he had consulted. His countenance and conjunctivæ were slightly yellow; tongue covered with a creamy fur; skin dry; appetite moderate; had flatulence, and frequently felt fulness and pain at the epigastrium after eating; urine high-coloured, and voided in a small stream, with some straining; slight tenderness over the liver on pressure; no enlargement of it indicated by percussion; pulse feeble and irritable. By examination after the action of the bowels, the mucous membrane being prolapsed, a florid granular surface, from which blood freely oozed, was observed; it was about the size of a shilling, and slightly raised from the surrounding tissue; it was very painful when touched; the finger introduced into the rectum did not detect any tumour. The treatment adopted was at first small doses of mercury with chalk, and extract of taraxacum, aperients every second morning, subsequently tonics, with nitric acid, and various preparations of iron; enemata of cold water were used, afterwards astringent fluids. Examination of the urethra detected a stricture, through which a No. 3 catheter was passed with some difficulty; the introduction of instruments twice a week was had recourse to, the size being gradually increased, till the natural calibre of the urethra was restored. By perseverance in the

remedies, his general health was much improved, the countenance became clear, the pain in the region of the liver subsided; but though feeling much better, the bleeding from the rectum continued. Having given medical treatment a fair trial without much benefit to the local disease, I deemed the application of nitric acid advisable. The bowels having been freely moved by extract of colocynth and blue pill taken at night, and an enema administered the following morning, the florid granular surface of the pile was exposed by a speculum, and freely touched with strong nitric acid, chalk and water being subsequently used to neutralize the excess of acid, and prevent injury to the surrounding tissue. After the operation, a dose of laudanum was administered. On the third day, the bowels were moved by castor oil; for some days subsequently he experienced smarting when at stool, but the pain gradually lessened. He was directed always to use enemata of cold water after defecating. It is now four years since I attended this patient, and he has not had the slightest return of any of the symptoms he previously suffered from.

[Mr. S——, aged 43, has always been of a costive habit, has suffered for many years from very distressing symptoms, usually attending internal hemorrhoids. About eight years ago they descended at stool, but retracted afterwards; for two years they have protruded through the anus on his assuming the upright position.]

The sphincter ani was relaxed, and two hemorrhoidal tumours, the size of hazel-nuts, dense and but slightly compressible, were prolapsed. By passing the finger into the rectum they were found to be connected to the upper margin of the internal sphincter. It being evident that removal of the tumours was the only treatment that could relieve him, and the state of the constitution admitting the immediate performance of the operation, it was decided that ligatures should be applied. He was ordered to take six grains of compound extract of colocynth and four grains of blue pill at bedtime, and the following draught in the morning: compound infusion of senna, six drachms; infusion of cinchona, six drachms; rhubarb, eight grains; tartrate of potash, one drachm; compound tincture of cardamons, one drachm; to have an enema of thin gruel. The bowels by these means having been very freely acted on, in the afternoon I passed a double ligature through the base of each tumour. They were seized separately by a pair of forceps, and drawn down by Mr. Thompson, who kindly assisted me, while I transfixed them with a needle. The ligatures having been drawn thoroughly tight, the ends were cut off within half an inch of the piles, which were then returned within the rectum. Half a drachm of tincture of opium in camphor mixture was administered immediately. On the second day after the operation, my patient, feeling no pain, had left his bedroom. His skin was cool, tongue moist, and pulse quiet. A laxative was prescribed to be taken if the bowels did not act the next day. In ten days this gentleman

called on me; the ligatures had come away, and the parts had quite healed. I advised him to take an aperient and tonic mixture to get the bowels into a regular state, and to inject half a pint of cold water after defecating. This plan of treatment had the desired effect, and he has not since experienced the slightest inconvenience.

[Mr. ——, aged 37, bowels habitually constipated, not accustomed to active exercise; for several years he has lost blood at stool, and at times has very severe pain. Two years ago a tumour protruded externally from the anus when at the water closet, which it has always been necessary to replace by the fingers.]

The sphincter ani was contracted; the mucous membrane of the rectum was observed to be congested. By digital examination a tumour, the size of a cherry, was detected, attached to the upper and anterior margin of the internal sphincter by a fold of mucous membrane; it was firm, and but slightly elastic. From the nature of the tumour it was decided to remove it by ligature. He remained under the care of Dr. Quain for three weeks, during which time his general health was greatly improved. The bowels having been thoroughly freed by the administration of four grains of blue pill, and six grains of compound colocynth pill at bedtime the previous night, and castor oil and an enema in the morning, with the assistance of Mr. H. Thompson, I applied a double ligature to the tumour, transfixing its base with a needle fixed in a handle. He remained in bed three days, and experienced but little pain. On the fourth morning he took a dose of castor oil; the bowels acted freely, attended with some uneasiness in the part. He was now permitted to get up, but desired not to sit or stand too much. To take the following draught every morning:—Compound infusion of gentian, one ounce and a half; sulphate of magnesia, one drachm; carbonate of magnesia, ten grains. One ligature came away on the fifth day, and the other on the ninth; for some days afterwards he had smarting at stool, but it gradually subsided. He took the medicine for three weeks, after which the bowels acted freely each day without it; he had greatly improved in appearance, was quite cheerful, and expressed himself as being better than he had been for many years.

Internal Hemorrhoid, attended with great pain, bleeding, and constant descent of the tumour; ligature applied.—The following case was also sent to me by Dr. Quain:—

Mr. M——, a publican, tall and stout, his eyes dull, and sclerotic conjunctiva yellow, his tongue large and flabby, covered with a thick fur, and the edges deeply notched by the impressions of the teeth. He informed me he took little or no exercise, sometimes not leaving the house for upwards of a week; he lives freely, but is not often intoxicated; had always suffered from constipation, and had long been annoyed by dyspeptic symptoms, as well as various uncomfortable sen-

sations in the rectum. Four years previous to applying to me, he discovered that "a lump" descended at stool, attended with bleeding and severe pain; it had always been necessary to replace it with his fingers. Digital examination detected on the right side an indurated pile, attached to the bowel, about two inches above the anus. An enema being administered, a pile the size of a large cherry was extruded. Considering the density of the tumour, its constant descent, and the strong desire of the patient to be relieved of his sufferings, it was decided an operation should be performed. Under the judicious treatment of the physician who referred him to me, in ten days the constitutional defects were remedied. At the expiration of this time, with the assistance of my friend and colleague Mr. Hulme, I carried a needle, armed with a double ligature, through the base of the tumour, and tied it firmly in two portions. The bowels had been freely relieved previous to the operation; after it had been performed, a dose of opium was administered. For four days, there was slight feverish excitement and œdema around the anus. These yielded to salines, low diet, and linseed-meal poultices. On the third morning, he took some castor oil, and repeated it every second morning for a few times. Enemata of flaxseed tea were daily used. By the eleventh day, the ligatures had come away, and the ulcers resulting had quite healed. The necessity of taking exercise was strongly impressed on him, and he was directed to inject half a pint of cold water after defecating, to use soap-and-water externally morning and evening, to live moderately, and to keep the bowels regular by the following mixture: compound infusion of senna, four ounces; compound infusion of gentian, three ounces; tartrate of potash, four drachms; tincture of orange-peel and syrup of orange-peel, of each four drachms: three tablespoonfuls early in the morning.

Internal Hemorrhoids of long duration; great loss of blood; removal of the tumours by ligature.—K. M——, aged thirty-seven, a cook in the service of Mr. Hulme, who requested me to see her, as he was then suffering from severe indisposition. She stated she was first attacked with piles ten years ago, and had never been well since. For the last five years, she has lost considerable quantities of blood at intervals. Hemorrhage had been going on for three weeks previously to my seeing her. She had not informed Mr. Hulme of her indisposition till she was no longer able to keep about. He ordered her to bed, and directed cold and astringent applications. When I saw her, she was perfectly blanched, and hardly able to turn in bed. Her pulse was feeble and quick. On making an examination, the anus was observed surrounded by a fold of integument greatly distended with serum, and having a pale, semi-transparent appearance. Three internal hemorrhoidal tumours existed: they were pendulous, spongy in texture, and about one inch in length, and three-eighths of an inch

in diameter. The mucous membrane was granular, and bled freely on being slightly touched.

Taking into consideration the duration of the disease, the state of the patient, and the condition of the tumours, I deemed removal of them by ligature the most appropriate plan of treatment. Early in the morning, she had taken a dose of castor-oil, which had acted freely. It was therefore determined to perform the operation at once. An enema of warm water was administered, and on being ejected the tumours were prolapsed. Double ligatures were then passed through each of them, and tied tightly, so as entirely to interrupt all vascular and nervous connexion. The ends of the ligatures being cut off, the piles were returned within the sphincter. Thirty minims of the tincture of opium were given, for the purpose of producing temporary constipation, and of tranquillizing the system. On the second day after the operation, she had pain in the bowel, and slight pain in micturating. Directed to have a hip-bath, to take a dose of castor oil the following morning, and to have an emollient enema twice in the twenty-four hours. The whole of the ligatures had separated by the eighth day; no bleeding had occurred since their application. Slight inflammation of the rectum supervened, which was due to the patient not attending strictly to the directions given her with regard to diet and medicines. It speedily yielded to simple treatment, and she made a favourable recovery. The external fold of œdematous integument collapsed, and the anal orifice assumed its natural size. She has had no pain, hemorrhage, or other symptom of the disease, and continues perfectly well.

Remarks.—Hemorrhoidal tumours are by some surgeons included in a single noose; but the method is unadvisable; for unless they are connected by a very narrow pedunele, the ligature cannot be drawn sufficiently tight effectually to cut off all vascular connexions, whereby the parts are longer in separating and a greater degree of inflammation and irritation is induced. Another important objection is the liability of the ligature to slip off, necessitating a second operation, and adding greatly to the patient's sufferings; in several of the cases recorded by Mr. Mayo and Mr. Howship these evils occurred, and instances have fallen under my own observation. It is, therefore, better always to pass a double ligature through the base of each tumour, and to tie it in two portions. An ordinary suture-needle may be used, but a small and well-made nævus-needle will be found the better and more convenient instrument. Sir Astley Cooper recommended the ligatures should not be drawn tight, thinking thereby to lessen the pain and irritation, but induced that which he was desirous of avoiding. When the object of the operation is considered, it cannot be doubted for a moment that the ligatures ought to be drawn as tight as possible, and I have never had occasion to repent having done so.—*Lancet, May* 17 *and June* 28, 1856, *pp.* 539, 708.

70.—CASE OF HEMORRHOIDAL TUMOUR REMOVED BY THE ECRASEUR.

By Henry Terry, Esq., Surgeon to the Northampton General Infirmary.

The case was one of large and aggravated hemorrhoidal tumour, of four or five years' standing, and accompanied with great local pain and general distress. It was of about the size of a hen's egg, covered with condensed mucous and cellular tissue, and disposed to bleed, sometimes partly reducible, at other times not at all so. The man had had a good deal of surgical advice, but found no permanent relief. It happened, unfortunately, that the *écraseur* could not be obtained in London, and it did not appear certain how soon it might be received from Paris. I was unwilling to delay the treatment of the case very long, and consequently, after waiting a certain time in vain, I determined upon proceeding with the ordinary operation by ligatures.

On the 22nd of July, I passed a strong double ligature, and enclosed the whole of the tumour in halves as tightly as I possibly could, chloroform not being used. He suffered great pain at the time, which was excessively increased afterwards, and accompanied with fearful general collapse. On visiting my patient half an hour after the operation, I considered his life in imminent danger; the pulse at his wrist was barely perceptible, and a cold clammy perspiration pervaded the whole surface of his body. He was at this time being undressed in a chair. By an immediate change of position, and by the aid of large doses of brandy, he shortly rallied a little, and pulsation returned, but he continued extremely ill and in intense pain for twenty-four hours, notwithstanding the administration of large quantities of opium. The hemorrhoidal tumour became black, and for a time I hoped the ligatures would remove it; but, on the second day, its circulation returned, and it was evident that the operation had failed.

On the 31st of July, nine days after the former operation, I tied the part again, the *écraseur* not having yet arrived. Chloroform was used, and I found lacerations at the base of the tumour, which enabled me to tie it with circular ligatures in three parts, without using any needle. By twisting the ends of the ligatures round little bits of wood, they were drawn with as much force and as tightly as possible. On the effects of chloroform subsiding, very great and long-continued pain was again experienced, but without collapse. In a few days, two of these portions, with their ligatures, came off; but the third and largest of the three remained, and again showed vascularity and active circulation.

The *écraseur* had now arrived, and I determined upon attempting to finish my case by its application. The tumour remaining was about the size of a nutmeg, and a slight touch with a tenaculum proved its free tendency to bleed. Chloroform was given; the little

tumour was pulled out by its ligature, and the chain put round its neck; the chain was drawn down till it was in close contact with the part, when the racket action of the instrument was begun, tightening the chain by one notch every fifteen seconds. In two and a half minutes —*i. e.*, by ten actions of this most ingenious contrivance—the tumour was off. There was hardly a drop of blood, and a small, clear, healing surface remained, the patient having no pain. He got up to breakfast the following morning, extremely gratified by the contrast between this and his two former operations.—*Asso. Med. Journal, August* 16, 1856, *p.* 694.

71.—CASE OF CUTANEOUS OUTGROWTHS FROM THE ANUS.

By W. D. Husband, Esq., Surgeon to the York County Hospital.

[The patient was strong and healthy, but of dissolute and irregular habits. He complained of several pendulous tumours growing from the margin of the anus. His attention was first drawn to them about eighteen months before, since which time they have gradually increased in size. He had suffered from chancre about two years ago.]

Upon examination, a large pendulous tumour, having the exaggerated characters of a condylomatous growth, was seen to hang down from the left margin of the anus; it was somewhat elongated, but broad and flattened, and nearly the size of a fœtal head. The pedicle was broad, smooth, and in appearance scarcely to be distinguished from the surrounding integument. The tumour was lobulated, having larger lobes subdivided into smaller ones, which were less distinct where the tumour was in apposition with the buttock. The tumour was of a dull pinky colour, but much coated with incrustations of exudation and dirt. The most offensive fetor was exhaled from the part. On raising this tumour so as to expose the anus, four or five smaller growths were seen to hang down around the margin of the anus, varying in size from an orange to a walnut. The sulci in the smaller tumours were much shallower, but their condylomatous character was equally evident, and they were attached to the anus by pedicles similar to that of the larger growth. The penis was encircled by a ring of condylomata of the usual size.

Operation.—I passed a strong double ligature through the pedicle of the largest tumour, as close as possible to the anus, and tied the ends as tightly as the short broad neck would allow, and then cut through the pedicle close to the tumour. In an instant the skin of the pedicle contracted so forcibly as to loosen the ligatures, and thus render them useless, and a violent gush of arterial blood somewhat surprised us, as we were scarcely prepared for such an occurrence from the excision of a condylomatous growth. Pressure was imme-

diately made on the bleeding surface, the patient was placed in the position for lithotomy, and three large vessels, one larger than, and the other two equal in size to, the arteries of the lower arm, were ligatured, and then, with a pad and perineal bandage, the patient was secured from the risk of further bleeding. Two days afterwards, the smaller tumours were ligatured and excised with no loss of blood, as their more slender pedicles enabled up to apply the ligatures more effectually. The man recovered rapidly, and the resulting cicatrices showed no tendency to any renewal of the disease.

Appearance of the removed growth.—A section of tumour showed irregular fibrous bands of a white glistening appearance, enclosing yellowish cellular substance. The centre of the largest growth seemed to have become disorganised; and to consist of broken down tissue, and the density and firmness of the tumour increased evidently from the centre to the circumference. The microscope showed irregular cells intermixed with fibrous tissue in various stages of development. Nothing like cancer-cells could be detected.

Remarks.—This case bears a strong resemblance to those detailed in 'The Association Journal,' July 26, by Mr. Pemberton, of Birmingham, in a very interesting paper on these singular growths; and especially to Case 3, the drawing of which very well represents the larger growth in the case now reported. I am induced to publish this case, as I can fully endorse the following statement of Mr. Pemberton: "The muco-cutaneous surface around the anus would appear to be in the male for these growths, what the pudendum is in the female. Still, among men they are of extreme infrequency, so much so, that I have not been able to discover a record of a pendulous growth altogether similar to the one I have described as having been observed in the male subject." Hence I am glad to find a case so entirely confirmatory of the accuracy of Mr. Pemberton's description, and also one having an important bearing on the origin of these singular tumours. I was, with him, equally unable to find a similar case on record; and, indeed, the information afforded in surgical or pathological writings respecting these larger condylomatous growths is vague and unsatisfactory.

With regard to the origin of condylomata, either around the anus or on the penis, we are always disposed to suspect their syphilitic origin. I have always had reason to suspect such origin in the cases which have come under my notice. I recently removed several condylomata of large size from the margin of the anus of a child of twelve months, in whom the symptoms of congenital syphilis were as marked as the secondary symptoms had been before its birth in both its parents; and, if the smaller condylomata have such origin, why may not these larger growths proceed from the same cause, if their fuller development be favoured by local causes, such as want of cleanliness, or by constitutional disposition, such as often exists, to the production of morbid growths? The habits of my patient were just those likely to encourage the full development of the outgrowths.

The diagnosis of the morbid growth presented no difficulty. The pendulous tumour was unlike any other. Its warty character was evident to the eye; and its papilliform appearance distinguished it from the fatty tumours, which very rarely are found pendulous in this situation. No pain had been experienced, and the fetid odour was certainly *sui generis*.

With regard to treatment there could only be one opinion. I had as little fear of hemorrhage as Mr. Pemberton, when he began to excise his third case; but, like him, I found the vascularity of the pedicle much greater than I expected. Had I been prepared for this, I should have passed two double ligatures instead of one through the neck, and thus have included a smaller portion of it in each ligature; but I certainly did not expect such a fearful gush of blood from a condylomatous growth. In books we are recommended to place the patient on his side, or stooping forwards, when we operate near the anus; but I would advise, in a similar case, the lithotomy position to be adopted, and thus a better view to be obtained of the part, and more command afforded over the hemorrhage. Thus we can apply with greater facility ligatures to the bleeding vessels if needed, as they assuredly will in the larger growths, if excision alone be practised, or the ligature, which ought always to be used, should slip. Should the *écraseur* realize the expectations held out, and enable us to cut through vessels without the usual resulting hemorrhage from such a procedure, we shall possess a valuable aid in the removal of these and other morbid growths.

The smaller tumours were excised, after the application of a double ligature, with the loss of scarcely a drop of blood; and such will always be the case if a ligature be carefully applied; that is, provided the neck can be really strangulated, which, as in the larger growth, cannot always be effected.

The result in my case has been as gratifying as in those of Mr. Pemberton. The patient came again into the hospital for a crushed foot a fortnight ago; and no vestige of the tumours, except the cicatrices, could be detected.—*Asso. Med. Journal, August* 16, 1856, *p.* 693.

72.—*Treatment of Fistula in Ano.* By E. A. Lloyd, Esq., St. Bartholomew's Hospital.—Some forms of fistula seem to get well by injection; and the best injection, one almost specific, which he has used for years at Bartholomew's, consists of half a drachm of nitric oxide of mercury, half an ounce each of mucilage and distilled water, mixed in a mortar for an injection, and used in the ordinary manner. —*Association Med. Journal, April* 5, 1856, *p.* 267.

73.—*New Method of Operating for Fistula Ani.* By Ancell Ball, Esq., Spalding, Lincolnshire.—The difficulty sometimes experienced

in operating for fistula ani.—1st, as regards the penetration of the bowel without wounding the index-finger of the operator; and 2nd, by the sudden withdrawal of the patient, and simultaneous approximation of the glutei maximus muscles at the moment of division of the intended parts,—has induced me to devote some attention to the subject, and ultimately led to the employment of a gum-elastic speculum ani, lined with glass plated, and containing an incisura half an inch in width and extending two and a half inches from the orifice of the instrument, which I have found to possess the desired property of completely overcoming the difficulties already alluded to. After deciding upon the propriety of an operation, and the proper evacuation of the bowel, the patient may be placed upon the side, near to the edge of the bed, taking care that the light may have full access to the diseased part. When the fistulous canal is somewhat tortuous in its course, the director should be introduced prior to the speculum; but when otherwise, it is not of much importance. A straight, sharp-pointed bistoury (the blade of which is immovably fixed in the handle) will readily slide along the groove of the director, and may, with ease and perfect safety, be then passed through the coats of the bowel and the incisura speculi into the interior of the speculum, where it can be easily perceived, and may then be withdrawn, in order to divide the intervening sphincter; after which the wound may be dressed in the usual manner. In the event of undue hemorrhage the speculum may be retained for a time, and plugged with lint saturated with appropriate styptics; and should not that suffice, the actual cautery may be employed, or the artery seized with a long pair of forceps bent at right angles near to its points, and then passed round them a piece of silver wire, the two extremities of which may afterwards be passed through a small double canula, fastening one end to the ring at the side of the canula, and then drawing the other end tight enough to close and even divide the inner coat of the bleeding vessel, in a manner similar to the strangulation of a nasal polypus.—*Lancet*, *Sept.* 6, 1856, *p.* 278.

74.—ON PROLAPSUS ANI.

By Prof. Syme.

[In a gentleman who had an enormous protrusion of the rectum, in size and form like a large cocoa-nut, looking more like a malignant growth than simple descent of the bowel, Professor Syme performed the following operation:]

The integuments round the anus being greatly relaxed and thickened, so as to constitute a number of pendulous folds, I removed all this redundant texture by repeated applications of the scissors, not in a circular direction, but pointed from the circumference towards the centre of the orifice. This would have been a painful operation if per-

formed on a conscious patient, but being executed under the influence of chloroform, was accomplished without suffering, and also the difficulties attendant upon involuntary straining. I then enjoined the necessity of strictly maintaining the horizontal posture, and of abstaining from food beyond what was absolutely requisite. The bowels were not disturbed for several days, and at the end of this time were evacuated without any protrusion or difficulty, in consequence, no doubt, of the intestinal coats regaining their natural condition, while the sphincter was no longer impeded in the discharge of its duty. In the course of a few weeks, the patient felt able to resume his service in an office of the government in London, where he has ever since been employed, and felt so well as to enter into the matrimonial state.

There is no better illustration of the evils which may result from the improper naming of a disease, than in the case of Prolapsus Ani. This title being understood to comprehend all protrusions beyond the orifice of the bowel, includes conditions entirely different in regard to their nature and remedy. It also suggests the idea of weakness in the sphincter, and leads this to be regarded as the cause of derangement, when, in truth, it hardly ever is so. Under the erroneous impression thus produced, mechanical support has been most improperly employed, and, if the frequency of advertisements in respect to contrivances for this purpose may be taken as a measure of the extent to which they are used, the amount of suffering thus unnecessarily endured must be very great.

In nearly all the cases of what is called prolapsus, there is no displacement of the bowel, and merely a protrusion of its lining membrane in the thickened vascular condition which constitutes internal hemorrhoids. When pain or bleeding is the predominant symptom of this disease, it generally retains its proper designation; but when the patient is chiefly annoyed by descent of the tumour, through the effect of exertion in the erect posture, the morbid state of the texture concerned is apt to be overlooked, so that the evil is attributed solely to relaxation of the sphincter. Many unhappy people pass through life in perpetual misery, from this source, to which peculiarities of conduct and manner might often be more correctly ascribed than to original disposition. A well known and much respected member of the medical profession in Edinburgh, whose writings are extensively read by the public, accidentally discovered, through comparing his own case with one for which he had requested my assistance, that a distressing annoyance of this kind, from which he had suffered, and endeavoured to palliate by bandages, for twenty years, admitted of effectual remedy by means no less easy than safe; and while writing these remarks, I have under my care a citizen of this place who during the same period of time has been similarly afflicted, without obtaining the relief which might have been so readily afforded. If such things happen in the very centre of metropolitan science and skill, the state of matters existing in less favourable circumstances may be readily imagined.

Whatever may be the symptoms proceeding from them, the treatment of internal hemorrhoids should be always the same; and this I established thirty years ago, at a time when very vague and unsatisfactory opinions existed upon the subject. I say *opinions*, since such was the dread of interference with the disease in those days, that it rarely became the subject of operation. The principles conducive to safety and efficiency then laid down were—1st, That the whole of the existing enlargement within the sphincter should be removed by ligatures; 2nd, That each of the tumours of which it is composed should be transfixed at its root by a double ligature; 3rd, That the ligatures should be tied with the utmost possible tightness; and, 4th, That any enlargement exterior to the sphincter should be removed by scissors. Morbid growths, whether within or without the anus, being thus taken away, the sphincter is allowed to resume its proper action, and the patient is relieved from prolapsus, no less effectually than from pain and bleeding.

But in other cases, comparatively rare, the coats of the rectum descend so as to constitute a tumour independently of any morbid growth beyond mere thickening, or engorgement of their texture. In children, this usually depends on the straining caused by irritation, as that of a stone in the bladder, and in old people it may proceed from a paralytic state of the sphincter. It may also, as in the case just related, depend upon a condition of the anus, remediable through proper management. For this purpose it is requisite that the whole of the pendulous folds of skin should be removed by incisions radiating from the centre of the orifice—that the patient should be confined to the horizontal posture for several weeks, even when the bowels are evacuated—and that the diet should be restricted, so as to prevent distention by feculent matters.—*Edinb. Medical Journal, August* 1856, *p.* 97.

ORGANS OF URINE AND GENERATION.

75.—ON LITHOTOMY.

(From the Manuscripts of the late Abraham Colles. Professor of Surgery to the Royal College of Surgeons of Ireland.)

1808. The staff should be held between the thumb and two fingers: this enables us to feel more surely cutting into the urethra, and, what is of more importance, enables us to depress the handle of the staff when about to divide the prostate. The staff should be kept well up in the angle of the pubes, and at the same time made to project a little into the perineum, as by this means you will have more room for your incisions, and run less hazard of wounding the rectum or pudic artery.

One incision through the integuments, and another through the muscles of the perineum are all to be made before cutting on the staff.

The staff is soon felt by the point of the knife, and by moving it from side to side of the groove. This incision should now be enlarged by dividing the membranous part of the urethra freely. Above all things, be careful to commence your incision of the membranous part sufficiently low, for by cutting high up you cut the bulb of the urethra, and cause a troublesome bleeding. The great disadvantage of entering the urethra too high up, consequently commencing the division of the prostate too far forwards, is, that the knife must run on the arch or convex part of the staff. This causes the great difficulty in the operation, to keep the back of the knife running along a convex part of the groove, and makes the operator use considerable force, and is in danger of throwing the knife out of the groove, and plunging into the space between the rectum and the bladder, or into the rectum.

The knife should run in a straight groove, and therefore the staff should have a long beak, nearly straight from the point to the arch; about two inches for an adult. You must depress the left hand with the staff, and the right hand with the knife, at the same time that you press forward the knife, especially in young subjects.

You may divide such parts as require it on withdrawing the knife from the bladder. Pass in the right index finger to ascertain the size of the opening, and move it about to enlarge it.

The blunt gorget introduced, or the finger, is the only security for passing any other instrument into the bladder; then introduce the forceps from below upwards, as the anatomy of the part directs. The forceps should be proportioned to the subject.—*Dublin Quarterly Journal, August* 1856, *p.* 41.

76.—NEW OPERATION FOR PHYMOSIS.

By T. B. Curling, Esq., F.R.S., London Hospital.

[This occurred in a little boy aged seven years, who was admitted into hospital for symptoms of stone. On examination it was found impossible to pass the sound, on account of phymosis, for which]

Mr. Curling performed the following operation, when the boy was under the influence of chloroform:—Taking a long, slightly-curved needle with a handle, and its point guarded by a piece of wax, (fig. 1,) he introduced it at the orifice of the prepuce, and carried it onwards above the glans penis to about a quarter of an inch from the corona, where it was thrust through the foreskin. The prepuce being raised and drawn forwards by means of the needle, a pair of curved forceps, with rough grooves inside the blades, was applied between the needle and the glans penis, so as to isolate the orifice and a large portion of the prepuce, (fig. 2.) These parts were then excised by a single stroke of a bistoury, carried along the convexity of the forceps. The cut edges of the skin and inner membrane were afterwards neatly adjusted, and secured with six fine silk sutures, which were removed on the second

day. The operation was followed by a little œdema, and a slight sore at the under part, consequent on the constant dribbling of the urine: otherwise the parts united well by adhesion.

Fig. 1.

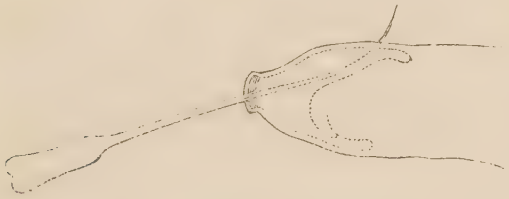
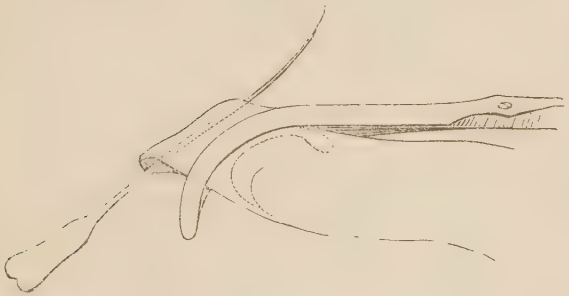


Fig. 2.



Mr. Curling remarked that this was a modification of, and an improvement in, the most recent operation practised by Ricord of Paris; and in cases in which it was considered desirable to excise the foreskin, this mode of proceeding answered admirably, the wound caused by the division of the skin so exactly corresponding with the section of the inner membrane as to admit of a very accurate apposition of the divided parts, and of perfect union by adhesion.—*Lancet, April* 26, 1856, *p.* 456.

77.—*New Mode of operating for Phymosis.*—The ingenuity of surgeons in devising new methods of performing this simple operation would seem to be inexhaustible. The latest is that of M. Bonnafont, whose method consists in tightly filling the cavity between the glans and prepuce with fine charpie, pushed in gradually through the narrowed opening by a director or probe; by cutting on this, the surgeon at once divides skin and mucous membrane in the same plane, and at any distance from the orifice which he pleases. The "stuffing," of

course, prevents any injury to the glans. Neither sutures nor *serre fines* are to be used, only water dressing for the first twenty-four hours, and simple dressing afterwards.—*Gaz. Med.*—*Dublin Hospital Gazette, June* 1, 1856, *p.* 141.

78.—TREATMENT OF STRICTURE BY PRESSURE.

By Samuel Solly, Esq., F.R.S., St. Thomas's Hospital.

[In the treatment of stricture we must not expect one unvarying plan to succeed; each case differs, and will require particular treatment, local and constitutional; we must not depend too much upon the mere mechanical surgical means, but this must be combined with well-directed medical treatment. It is very probable that many cutting operations for stricture, whether the knife be used within, or without the urethra, might be avoided by patient medical treatment previous to the use of any instrument. The case here reported illustrates the value of medical treatment, in avoiding the use of the knife, and in relieving the constitutional irritation from the use of dilating instruments.]

I must take this opportunity of saying that, as far as my own experience goes, there is not one case in two hundred, of even very bad strictures, where the knife need be used at all. I do not consider that it should be employed in any case where you can succeed in introducing the thread catgut bougie—that is, in any stricture which is pervious. I believe that the cutting operation for stricture, even when performed by the most skilful operators, is a dangerous proceeding; I believe that when the records of such cases are given to the public we shall be grieved with its fatality. My experience has taught me that, when you can once introduce a bougie into the bladder, you can cure that stricture without cutting it. By the plan which I am now advocating, the adventitious tissue which forms the stricture is rapidly absorbed under the stimulus of pressure, and I believe that this action of the absorbents is a natural and conservative action—a safer action to the patient than the scalpel of the chirurgeon.

John M——, aged thirty-four, a tall, muscular, and healthy-looking man, a native of England, but has been residing for the last ten or twelve years as a farmer in America, was admitted under my care, Jan. 1st, 1856; Mr. Way, dresser, from whom I have derived the following details:—

The patient states that he first contracted gonorrhœa in 1849, about seven years ago; this lasted eighteen months. Shortly after this, he perceived that the stream of urine became smaller. This difficulty went on increasing, but without his seeking relief, until the winter of 1854, when it ceased to flow, and only passed in drops. Let me remark, in reference to this history, that you must not suppose that strictures are invariably the result of long-continued or neglected

gonorrhœa. Any circumstance which disturbs the flow of urine from the bladder, and thus induces spasm in the accelerator urinæ, or muscular coat of the urethra, will induce stricture: stone in the bladder, the passage of gravel in the urine, disease of the prostate, inordinate indulgence in coition in persons advanced in life, onanism, &c.

He says "that he applied to ten different surgeons in America for relief, and that he was also in the Buffalo Hospital, but without obtaining it; that the stricture appeared to be impermeable, none being able to introduce either bougie or catheter; that, having read some lectures in 'The Lancet' of Mr. Solly's, he determined to come to England to be under his care." Now, I need hardly say that all accounts from patients must be received *cum grano salis;* but I have quoted the exact words of my dresser, as I think they show the extreme obstinacy of the stricture.

On admission, his urine passed by drops only, causing him severe pain. It occasionally dribbles away without his knowledge. This dribbling away in small quantities is one amongst many instances of the conservative action of Nature during disease. It is this incontinence of urine, so worrying to the patient, which, in severe stricture, really saves his life. It is like the diarrhœa which accompanies stricture of the rectum, which, though often mistaken for the disease itself, and the first discovered symptom of it, is really a conservative action induced by Nature to prevent fatal constipation. On account of the irritability at the neck of the bladder, he is compelled to micturate a great many times during the day. Pulse natural; skin moist; tongue slightly furred; bowels regular: appetite good, and he sleeps well. Urine alkaline, of a very pale colour, and loaded with phosphates and mucus; specific gravity, 1017.

Jan. 2nd. Stricture found to be situated in the membranous portion of urethra, exceedingly tight and unyielding, and could not be penetrated by the smallest catgut bougie. Ordered to keep his bed and to take iodide of mercury, one grain, three times a-day, and buchu mixture, an ounce and a half, twice a-day. I prescribe the iodide of mercury because I believe that it excites the absorbents to remove abnormal deposits more rapidly than simple mercury.

3rd. Bougie again tried, but unsuccessfully.

5th. Pressure over the hypogastric region causes pain; urethra very irritable. Ordered, cupping to the perineum to eight ounces, to be followed by warm fomentations.

6th. Continue warm fomentations.

7th. Introduced the bougie as far as the stricture, and allowed it to remain half an hour. Gums sore; to leave off mercury.

[17th. Introduced a wax bougie, armed with belladonna, as far as the stricture.

18th. The stricture was penetrated by a very small catgut bougie, but, unfortunately, the man pulled it out at the end of four hours.]

23rd. At eleven, a.m., introduced another wax bougie armed with belladonna as far as the stricture. At half-past one, p.m., the stricture was again passed by Mr. Solly with a long catgut bougie, over which he passed a No. 5 elastic tube, and withdrew the bougie without causing much pain.

24th. The "tube" has not caused sufficient uneasiness to warrant its removal.

26th. There is a free discharge of pus by the side of the tube. The tube was to-day withdrawn, and a No. 8 common elastic catheter was passed and fastened, scarcely causing any pain.

29th. Is perfectly easy; health good.

30th. A No. 10 catheter introduced.

Feb. 2nd. A No. 12 catheter, the largest size that we use, was introduced without any difficulty.

By this brief report you will perceive that this almost impermeable stricture has been removed in ten days from the passage of the first conducting bougie and catheter.

15th. The patient has permission to leave his bed. He is able to pass for himself a No. 12 catheter. He is an intelligent man, and I have no doubt that he will pass the instrument regularly, and thus prevent a recurrence of the disease. I generally recommend that a bougie should be passed every other day for the first week or fortnight, depending, of course, on the amount of irritation which the passage of the instrument induces. I recommend afterwards that the periods should be lengthened to once a-week, and then once a fortnight, but that the use of the instrument should never be abandoned altogether.

The above case, at the same time that it proves the value of the conducting bougie, also shows the value of medical treatment as an adjunct. I doubt very much if I should ever have succeeded in passing any bougie, even the smallest, if I had not employed local bloodletting freely and repeatedly, the warm bath, constant poultices to the perineum, and last, though not least, mercury and iodine internally.

[Cases such as this show that you ought rather to avoid the use of the knife in the treatment of stricture when other means will attain the same end.]

The longer you practise your profession the more will this principle be impressed upon your minds. There is another thing to be remembered in the treatment of stricture: never be ashamed to leave the bedside of a patient without succeeding in passing a bougie. The late Mr. Copeland, who was as sound and practical a surgeon as any in his day, said to a patient, who afterwards came under my care with a very irritable stricture and false passage, "Mind you never place yourself under the care of a surgeon who is afraid to acknowledge that he cannot always succeed in passing a catheter." I am told that a hospital surgeon, now deceased, passed a sleepless night from vexation if he failed to introduce an instrument into the bladder in the presence

of his pupils. Such a man must have made many a false passage. Of such a proceeding you should have the most intense horror. Every good surgeon will fail occasionally in the introduction of a bougie, but no good surgeon ought to make a false passage, though a skilful surgeon will sometimes do it, when his temper or his pride rules his hand instead of his reason and his conscience.—*Lancet, April* 26, 1856, *p.* 447.

79.—OBSERVATIONS ON THE TREATMENT OF STRICTURE OF THE URETHRA, WITH ILLUSTRATIVE CASES.

By Dr. James Wallace, Surgeon to the Greenock Infirmary.

[A nailmaker, aged 30, was admitted on the 3rd of February, 1853. He stated that he had had stricture for six years. On examination, a very tight stricture was found about two inches in front of the bulb, and commencing from the point of the obstruction ; extending backwards there was an oval tumour of about an inch and a-half in length.]

On the 5th, 8th, and 11th, systematic attempts were made to pass a catheter, but without success. On the 5th and 8th, however, a No. 2 was introduced half way through the stricture, which appeared to be co-extensive with the tumour, and was felt to be very rough and hard ; and on the 12th, a No. 6 was found to have slipped into the bladder, after having, on the day previous, been fixed with its point pressing against the impediment. The instrument was then withdrawn, and its place supplied by a No. 7, which was retained till the 14th. But two days afterwards a No. 5 only could be introduced, and on the 23rd none larger than a No. 4, although on the 18th the urethra admitted a No. 8. Nor did any improvement follow, for on the 25th and 26th the patient was unable to make water without the use of a catheter—a No. 7 being passed only with difficulty, and without obviating contraction, which was so great on the 28th, as well as on the 1st of March, as to prevent the insertion of an instrument of the smallest size. The swelling, however, was unchanged, and micturition as frequent and in as small a stream as formerly ; and although, on the 2nd, a No. 8 could be introduced, it was felt so firmly grasped as to lead to the belief that the urethra would again resist as capriciously as before.

Treatment by dilatation having thus signally failed, I resolved to perform the operation of urethrotomy, as recommended by Mr. Syme. Accordingly, on the 4th of March, I placed the patient fully under the influence of chloroform, and, after passing a staff grooved on its convex side, divided the corpus spongiosum through a little more than the whole extent of the tumefied portion. The staff was then withdrawn, and a No. 8 catheter introduced and retained in the usual way for the space of two days, the section being attended with the loss of scarcely more than an ounce of blood, and followed by no immediate disturbance

further than a slight feverishness, which commenced with a rigor on the 5th, and terminated 36 hours afterwards. At that time the urine was flowing equally by the opening in the perineum and the meatus; but on the 12th, no instrument having been employed in the interval, it was found to escape more freely by the latter than the former; and a fortnight afterwards, catheters, rising gradually from No. 8 to No. 12, having been passed every third or fourth day, the swelling was entirely reduced, and the lips of the incision closed to about the diameter of an ordinary-sized quill, micturition at the same time being not more frequent than natural. After this, unfortunately, the patient became affected with dysentery, which continued more or less during the whole of April, and retarded very materially the healing of the aperture. Cicatrization, notwithstanding, was complete by the 3rd of May, at which date, as well as on the 2nd, 9th, and 16th of the month preceding, a No. 12 was passed with the most perfect ease. The general health, at the same time, was so far established as to enable me to discharge the patient three days afterwards, with an injunction to return to the dispensary once a fortnight, in order to have a full-sized instrument introduced. With this, however, he complied only twice or thrice, and I lost sight of him entirely till the 23rd of May last, when I accidentally met him dressed in the uniform of the —— Militja. At my request he called at the hospital, where, in the presence of Mr. Macintyre, the house-surgeon, I passed successively, and without the slightest difficulty, a No. 8 and No. 12. He informed me, that after leaving my care he had enjoyed excellent health, and that he had never had the least indication of a return of the contraction; the stream of urine having kept always full, although no catheter had been passed in the interval, and although he had frequently indulged to excess in the use of ardent spirits. So well, in fact, did he consider himself, that, after enlisting, he never thought, though anxious to get off, of calling the attention of the surgeon to the cicatrix, which was so smooth and close as to be visible only on the strictest scrutiny.

[A sailor, aged 37, was admitted on the 2nd of February, 1853. He had been afflicted with the symptoms of stricture for eight years, complicated with perineal fistula. The opening in the perineum closed up, and he has repeatedly suffered from acute retention, which was usually relieved by the re-formation of the fistula. On the present occasion, in consequence of excess, he became afflicted with pain and swelling in the perineum, which gave way ten days afterwards in three places, but without relief.]

On examination, the perineum feels indurated, and is slightly pained on pressure; an opening sufficient to admit a probe—which can be passed two inches in the direction of the membranous portion of the urethra—existing nearly half an inch to the left of the raphé, and one in front of the anus; while, on the opposite side of the mesial line, and almost on the same level, are the cicatrices of two others, which closed

in little more than twenty-four hours after they were last formed. On attempting to introduce a catheter, a stricture is detected about half an inch behind the meatus, and allowing to be passed—and that, moreover, only after considerable manipulation—no instrument larger than a No. 3, which is again caught about the bulb, where the obstruction is so great as to resist even a No. 1. The urine is passed very often and with great straining, and escapes from the fistula as well as the meatus in a small dribbling stream. The patient, besides, is remarkably irritable, and suffers much from spasm during attempts at catheterism.

Such being the nature of the case, I began on the 4th to dilate the strictures systematically, and succeeded in passing a No. 5 through the anterior. On the 8th and 10th the operation was repeated, the catheter on the last of these occasions being fixed with its point pressing against the deep-seated impediment, and retained for twelve hours—an expedient which produced no apparent benefit, in consequence of the irritability of the patient being so great as to lead him frequently to withdraw the instrument. For three weeks after this, catheters, gradually increasing in size from No. 5 to No. 12, were every third day introduced through the anterior obstruction, and attempts made at the same time with others of smaller calibre to pass the one at the bulb. In this way the stricture behind the meatus was completely overcome, and the patient enabled to keep his water for four or five hours at a stretch, the stream being much fuller and the aperture in the perineum entirely closed. This, however, was followed by the re-opening of one of the old fistulæ on the right side of the raphe, from which, also, there was an escape of urine during micturition, but only in drops. At last, on the 1st of March, while the patient was fully under the influence of chloroform, a No. 7 was introduced into the bladder; the posterior stricture being found to be very rough and hard, and to embrace the catheter very tightly. The instrument was then kept in for twenty-four hours, and a further attempt made to pass it on the 4th, but without success, the bulbous portion of the urethra resisting so spasmodically as to admit not even a No. 1. On the induction, however, of a state of anæsthesia it again yielded, and to such an extent that a No. 9 could be got in, though not without difficulty.

Both strictures having been thus dilated, I was desirous of watching, for a short time, the progress of the case under no interference at all; for, as I regarded the deep-seated one as peculiarly adapted for Syme's operation, I thought it necessary to ascertain, before having recourse to division, whether the other would again contract so as also to require the use of the knife. But this I learned in a way different from what I wished, for the patient, in consequence of the great relief afforded by the measures already employed, believed that the disease was entirely removed, and, with the precipitancy common to his class, insisted, notwithstanding the existence of the perineal fistula, on being discharged from the hospital. On the 7th, accord-

ingly, I had to let him go, but with great reluctance. Four days afterwards, however, he came to the dispensary for the purpose of having a catheter passed, but on that occasion none could be insinuated through even the anterior obstruction, which became relaxed only on the exhibition of chloroform, when a No. 8 was got in, but only to be effectually opposed at the bulb, where the resistance was so strong that a No. 1 could not be introduced. Nor did matters improve after this; for on his appearing again on the 15th, the penis, anterior to the scrotum, as well as the adjoining portion of the latter, was considerably swollen and pained, pus being observed to escape freely from the meatus when pressure was made on the corpus spongiosum a little behind the seat of stricture. In this situation, moreover, fluctuation was distinctly perceptible, so that there was unequivocal evidence of a perforation of the urethra. The patient being now under the necessity of coming into the house, a common director was passed through the first stricture, and an incision made through the skin and fascia, the latter of which was found separated on both sides from the body of the penis. Vent having been thus given to about an ounce of healthy purulent matter, another incision, an inch in length, and extending from a little before the constricted portion to the point of rupture, was made through the corpus spongiosum itself. After this the cellular inflammation rapidly abated, and without anything of an untoward nature following, except an attack of orchitis on both sides, which was, however, easily subdued by appropriate treatment. Cicatrization, besides, advanced so favourably, that by the end of the month the opening made in the urethra was entirely closed, no urine having escaped from it since the 24th. At that date, as well as on the 29th, a No. 9 was passed down to the bulbous portion of the canal; and for five weeks afterwards, repeated attempts, aided and unaided by chloroform, were made to overcome the obstruction in that situation, but without success, till the 7th of May, when a No. 7 was got in with some difficulty, and while the patient was under the influence of the anæsthetic. The stricture being then found as gristly as ever, and the perineal fistula still patent, and micturition, at the same time, frequent and accompanied with straining, I resolved to delay no longer performing urethrotomy, as I had originally intended. On the 10th, accordingly, after the patient had been rendered insensible by chloroform, a staff, grooved on its convex side, was passed into the bladder, and an incision, two and a half inches long, made through the skin and fascia in the mesial line of the perineum, its lower angle being about an inch in front of the anus. The finger placed in the wound now detected the deep portion of the urethra separated from the subjacent parts, the interspace being in communication with the fistulous openings, and extending for some way anterior to the bulb. This itself was considerably enlarged and extremely condensed, and the canal, in that situation, as well as for a few lines in front, remarkably constricted.

The whole of the bulb, therefore, and a small portion of the corpus spongiosum anterior to it were divided; the incision which was made from behind forwards, being about an inch in length, and attended by the loss of no more than two ounces of blood. The staff being then withdrawn, a No. 9 catheter was introduced into the bladder, and kept in for forty-eight hours, two days after which it was again passed, and in four days more a No. 10. At this time the urine was found to escape equally from the meatus and the aperture made in the perineum, but a month afterwards it was observed to flow principally from the former, the incision being closed to an opening existing in the centre of the cicatrix, and having a diameter of about the eighth of an inch. During the interval, a No. 10 had been passed every fourth or fifth day, and nothing unfavourable had occurred except a slight attack of hemorrhage, which set in on the 21st of May. This, however, did not appear to proceed from the divided surfaces of the corpus spongiosum, but rather from between the latter and the fascia at the place where they were separated from one another in front of the bulb. It amounted, moreover, to no more than six ounces, and was easily checked by a compress and bandage, gallic acid being given, at the same time, internally, for greater security. Nor did any other complication afterwards arise to interrupt the progress of the case, the only source of anxiety being the slowness with which cicatrization advanced for a month after the middle of June. During that time a No. 11 was passed every fifth or sixth day, but during the next four weeks no instrument whatever was used, in consequence of the point of the catheter being found to slip readily through the opening in the urethra into the space below the membranous portion. The incision, at the same time was occasionally touched with the nitrate of silver, and with so much benefit, that by the middle of August it was contracted to an aperture capable of admitting merely the point of a small probe, and allowing the urine to escape during micturition only in drops. The original fistula, besides, was completely closed, and the local uneasiness entirely removed, the canal being in such a state that a No. 11 could be passed with the most perfect ease. The general health, likewise, was so good, that I would then have had no hesitation in discharging the patient, but for the nature of his occupation, which would necessitate his leaving the place before I could have the means of judging as to the probable permanence of the cure. For this reason, as well as because he made himself generally useful in the house, he was allowed, although the incision had been wholly closed since the beginning of September, to remain till the 27th of the following month. During the interval, a No. 11 had been passed every fortnight, but after that only one opportunity was afforded of repeating the operation. This occurred about two weeks after the patient left the hospital. He was then about to proceed to sea, in consequence of which I gave him a No. 9 metallic catheter, and taught him how to use it himself.

This he was enjoined to do every four weeks at least; but in a letter which he sent me, and dated Moulmein, May 24, 1854, he stated that he attempted only once to introduce the instrument, and was afraid to pass it much beyond the seat of the anterior obstruction. Micturition, however, was easy, and in a full stream, the general health, at the same time, being better than it had been for ten years previous.

Notwithstanding all the evidence that has been adduced in favour of this operation, since it was first proposed by Mr. Syme, it is not a little remarkable that the propriety of having recourse to it under any circumstances at all should, in certain quarters, be still strenuously opposed. Leaving out of consideration the question as to the existence or non-existence of the impermeable stricture, the main objections most commonly urged against it are—1st, that it is unnecessary; 2nd, that it is attended with little or no success; and, 3rd, that it is difficult and dangerous. The first of these rests on the belief, that if a catheter be introduced into the bladder, no matter with what difficulty, the disease can be removed by dilatation alone. This, no doubt, in the vast majority of cases, will be found to suffice; but, on the other hand, instances are occasionally met with in which such a mode of treatment is followed by no benefit whatever, the absorption that may have been excited by the passage of an instrument being uniformly succeeded by farther deposit, or, at all events, by increased contraction in the constricted portion of the canal. In such a condition, it is plain, something more is required, unless it is determined that the patient shall be allowed to drag on a miserable existence. Hence the employment of other methods besides that with the bougie, such as division with a lancetted stilette, and the application of caustic potash or the nitrate of silver. But these were long ago shown by the concurrent testimony of most writers to be fraught with danger, and not productive of any beneficial result, so that a certain class of cases still remained as a standing opprobrium in the domain of surgery. Mr. Syme, therefore, had good reason for venturing, a few years ago, to deviate from former modes of procedure, and for doing so is entitled, even if failure had followed his exertions, to something different from the vituperation with which he was at the time assailed. But the innovation, fortunately, turned out otherwise, and to an extent so marked that it is not easy to understand how the second objection could have been advanced at all. There is strong reason to suspect, however, that one element essential to the success of the operation has by many been entirely overlooked, and that is the necessity of passing a full-sized bougie at intervals, gradually increasing, and for a considerable time after the cicatrization of the opening made in the urethra. Moreover, every hospital surgeon knows that many patients subjected to operations, and particularly those belonging to country districts, neglect following up the instructions given them before dismissal, so that it is not at all improbable, that if any of this class were falling into the hands of

other practitioners, they would, in most cases, be looked upon as exhibiting instances of failure. Be this, however, as it may, it may with safety be asserted—so far as a judgment can be formed in the present state of the question—that nothing has as yet been laid before the profession sufficient in any degree to be held as a counterpoise to the results brought forward by Mr. Syme. Hence the third objection, on the assumption even of its being well-founded, may be regarded as of no weight at all; for if an operation is proved to be necessary, and has in similar instances turned out successful, danger and difficulty cannot for a moment be allowed to stand in the way of its execution. But, independently of that, opposition on these grounds is *per se* without the sanction of experience. Besides, the fear of hemorrhage, which is the point usually most strongly insisted on, is based very much on a view of the relations of the parts involved, which is not in accordance with correct anatomical knowledge; for although it has been repeatedly shown that the arteries of the bulb run no risk whatever, provided the incision is strictly in the mesial line, it is taken for granted that, in cases having the obstruction far down, they cannot by any possibility escape division. It cannot be denied, at all events, that the objection comes with great inconsistency from those who, believing in the existence of impermeable stricture, have little or no hesitation in resorting to a plan neither so safe nor so easy of execution, namely, cutting upon the point of a catheter passed down to the seat of constriction, and then dividing, in a haphazard manner, the contracted portion of the urethra.

So far, then, as a general consideration of the question goes, the operation is quite justifiable, and not attended with the drawbacks urged against it; nor are the principles on which it is established unsupported by the cases above recorded, for in both it was performed without any difficulty, and with a loss of blood exceedingly small, success being so marked, that, in Case 1, after the lapse of more than two years, there was not the slightest appearance of the disease, while in Case 2, about fourteen months after section of the anterior, and twelve after that of the deep-seated stricture, the patient described himself as free from the local affection, and generally in better health than he had been for ten years previously. These results, besides, will appear the more remarkable when it is remembered that, in Case 2, the bulb itself was subjected to division, and that in both there was a total neglect of the instructions given as to the passing of a catheter from time to time. There was, no doubt, in Case 2, some secondary hemorrhage; but this proceeded from the separated fascia, and not from the corpus spongiosum, while, as regards the ultimate issue, it is probable that the section resorted to, which was rather more extensive than that usually practised, had no small share in compensating for what, in most cases, is a *sine qua non* to the success of the operation. Then, with respect to the propriety of having recourse at all to this plan of procedure, it will have been seen that, in Case 1, the method by dila-

tation had entirely failed, in consequence chiefly of the perineal tumour, which was formed evidently of fibrine effused into the substance of the corpus spongiosum. In such a case, some would have been disposed to leech and counter-irritate the part in some way or other, and perhaps go the length of subjecting the patient to a course of mercury. But it is rather problematical whether any or all of these means would have ended in the complete absorption of the adventitious structure. Indeed, it is more than probable that an amount of fibrous tissue would be left sufficient, from its inherent tendency to contraction, to aggravate very materially the original stricture, and so necessitate adoption of the mode by external division at a time when its execution would not be so easy. Again, in Case 2, it was almost certain, from its history, as well as from the difficulty experienced in passing an instrument, that the patient would derive but little lasting benefit from the dilatation effected. When it is considered, moreover, that the nature of his occupation was such as would most likely prevent him from obtaining assistance in the event of retention, it will not appear surprising that urethrotomy should have been determined on before the results of treatment with the bougie were fully ascertained. This, no doubt, will apply equally to both modes of procedure ; but it was surely not unreasonable to believe that there was less likelihood of the patient escaping the inconvenience and dangers to which he was liable, by the employment of a method which, in such cases, is unfortunately too often merely palliative, than from one according to which the cause of the fistulæ is divided so freely as to allow them to close thoroughly and soundly from the bottom. In fact, the progress of the case immediately before, as well as after section of the anterior stricture, distinctly shows that much suffering would have been avoided, and a more speedy recovery obtained, had no delay in operating on the deep-seated one been permitted to occur. Were a similar case, therefore, again presenting itself, it would be better for the surgeon, as soon as a staff could be introduced into the bladder, to cut both at once, and treat them afterwards *pari passu.*

[*Case* 4.—A cooper, aged 45, stated that he had laboured under the usual symptoms of stricture for seven years, during which time he had made his water almost entirely in dribbles.]

On trying to pass a catheter, I found a stricture near the bulb, and so tight as to resist even a No. 1, which was likewise effectually opposed in a second attempt made in his own house three days afterwards. I then fixed a No. 8 in the urethra, with its point pressing against the obstruction, and directed the patient to keep it as much as possible in the proper position. On the day following I succeeded, after some manipulation, in passing it into the bladder, in which it was retained for twelve hours. By this plan the dilatation was almost completed at once, and the patient enabled, in three days more, to proceed on a voyage, in fulfilment of an engagement as a ship's cooper, a

knowledge of which was my chief reason for having recourse to the procedure.

[*Case* 5.—A merchant, aged 55, called on the 16th of May, 1853, in consequence of retention of urine. He stated that he had had stricture 27 years before, which, after long treatment, was eventually cured, till two years ago, when the symptoms again returned.]

On attempting to pass a catheter, I found a stricture existing near the bulb, and so tight as to resist a No. 1. I accordingly gave the patient an opiate suppository, and recommended him to go home and take a warm bath, promising, at the same time, to visit him in the evening. But by that time the necessity for immediate manipulation was removed, in consequence of his obtaining relief in the natural way, after coming out of the bath. He afterwards called on me, however, twice a week, in order to have an instrument passed, but for nearly three months I was invariably foiled. I had several times urged him to allow me to put him under the influence of chloroform, but to that agent he had invincible objections. Nor was he less reluctant to stay at home. Taking advantage, however, of a holiday which occurred here about the end of August, I fixed, on the night previous, a No. 8 in the urethra, and in the morning made systematic attempts to introduce an instrument, beginning with the No. 8, and gradually descending to a No. 1: the latter of which I at last succeeded, and with comparative ease, in passing into the bladder. It was then retained for 24 hours, after which the patient was allowed to move about as usual, instruments of larger calibre being employed every third or fourth day, and with so much benefit as to render the urethra, in less than a fortnight, capable of admitting a No. 10 or No. 11.

The foregoing cases are brought forward, in order that attention may be directed to an expedient which, there is reason to suspect, has been but seldom employed in the treatment of stricture, but which, so far as my experience goes, is possessed of an advantage not to be overlooked. It consists in passing a No. 8 catheter as far down as it can be got, and, by means of tapes, keeping it with its point pressing with moderate firmness against the obstruction. It is then allowed (the patient having been previously shown how to prevent it from shifting its position) to remain for a space, varying from 12 to 24 hours, on the termination of which, systematic attempts are made to overcome the impediment, the No. 8 being first employed, and then, if necessary, others of smaller calibre, and in a gradually descending scale. By this method absorption of the abnormal structure was effected so speedily, and to such an extent, as to allow in Case 4 a No. 8, and in Case 5 a No. 1, to be passed at the first trial, and without the slightest difficulty, no manipulation being required in Case 1, in consequence of the artificial pressure being of itself sufficient to make the instrument glide into the bladder. It failed, no doubt, in Case 2, but as there was in that instance anything but co-operation on the part of the

patient, the result may be regarded as in no way telling against the procedure. It is not meant, of course, that it will always succeed, and still less that it should be resorted to in every case; but it may be fairly inferred from the facts just detailed, that it is a powerful adjuvant to the ordinary mode of treatment with the bougie, and that the surgeon will be fully justified in employing it in certain cases, which a slight consideration will show may be classified as follows:—

1. Those in which the contracted portion of the urethra is longer than usual, as in Case 1.

2. Those which afford but little time for treatment of any sort whatever, as in Case 4.

3. Those in which the stricture, notwithstanding the advantages arising from rest and confinement, is likely to resist for a considerable time the passage of an instrument, as in Case 2. And,

4. Those in which the stricture, though of rather an obstinate nature, would in all probability speedily yield, provided there was on the part of the patient, a total abandonment of active exertion—a condition, however, which, from some cause or other, he cannot be induced readily to fulfil, as in Case 5.

It is here taken for granted, of course—and few will be disposed to deny its truth—that in the treatment of stricture, as in that of almost every other affection, the efforts of the surgeon are very much facilitated when he has it in his power to command absolute or even comparative quiet. But in private practice, and so long as there is no urgency in the case, this is not unfrequently next to impossible; for many who occupy a good position in life are naturally extremely averse to anything likely to interrupt their business, and afraid, at the same time, lest the confinement necessary might lead to an exposure of the results of early folly; while others, who are lower in the social scale, may find their circumstances so depressed, as to render a discontinuance of work practicable only on the infliction of hardships on those dependent upon them. By the plan proposed, however, the patient need not be prevented from attending to his occupation, inasmuch as the case can be managed with almost no inconvenience, by having the catheter fixed at bed-time, and systematic attempts made at catheterism on the following morning. Nor will the procedure be less serviceable in instances presenting, in addition, the drawback characteristic of Class II., as in that of a shipmaster, who may have only a few days to spend on shore, and be unable, at the same time, to give himself the justice he requires, but who is anxious withal to have something done, so as to allow him to go on his voyage with at least comparative security. In such a case, it is plain, but little progress could be made by the ordinary mode of treatment with the bougie. Indeed, the time allowed might be almost gone before even a No. 1 could be passed. It may be said, however, that in this, as well as in the whole of the cases classified above, the end in view would be as

readily attained by the free exhibition of chloroform; but it ought to be remembered that that agent may be inadmissible, on account of suspected or ascertained pulmonary or cardiac disease, and that, as it necessitates the services of an assistant to watch its effects, it may be strongly objected to by patients over-sensitive on the score of secresy. It exercises, no doubt, a powerful influence in making troublesome strictures easily permeable; but as it acts simply by removing spasm, as well as voluntary straining on the part of the patient, it is not likely to be so beneficial in cases wherein a speedy cure is desirable, as a method which operates by exciting immediate absorption, and thereby effecting a rapid dilatation. Besides, manipulation, even with the aid of chloroform, is not always successful; so that, although the anæsthetic were contra-indicated in no way whatever, there might still be sufficient ground for having recourse to the plan which has just been brought under discussion.

To prevent, however, any misconception as to the practice which the writer would recommend to be followed as a general rule, it may be as well to state, before closing these remarks, that in cases which have resisted for a considerable time the smallest sized catheter, chloroform should not be withheld, provided the conditions required for its administration are present; that failing this, recourse should next be had to the mode reviewed above, which can be repeated, if necessary, after a moderate interval, and alternately or conjointly with the former; and that, if the patient can be confined to the house, the instrument, on the obstruction yielding, should be kept in the bladder from one to three days, dilatation being afterwards effected in the usual manner, which in most cases will be found to be a work of no great difficulty.—*Glasgow Med. Journal, April* 1856, *p.* 1.

80.—TREATMENT OF URINARY FISTULÆ.

By Henry Thompson, Esq., Hon. Surgeon to the St. Mary-le-bone Infirmary, &c.

[The following remarks refer to those cases dependent upon actual destruction of the substance from the walls of the urethra and superjacent parts. The common causes are sloughing from extravasation of urine, simple and phagedenic ulceration and mechanical injuries:—]

Generally a portion of the floor of the urethra is destroyed, as well as the structures which have intervened between it and the external surface, so that in many cases more or less of the mucous membrane of the upper aspect of the canal is visible from the outer orifice. As a consequence, the whole, or nearly the whole of the urine passes by the artificial channel in a full stream. Such abnormal apertures may be regarded, for practical purposes, as naturally arranging themselves into two distinct divisions, viz.:—

(a) Those which exist before the scrotum, or in the penile portion

of the urethra, sometimes called ante-scrotal or urethro-penal fistulæ; and

(b) Those which are found in or behind the scrotum, known simply as scrotal and perineal fistulæ.

A broad distinction exists between the lesion of each division, in relation to their amenability to treatment, and to the nature of the operative measures which must be undertaken with a view to their cure. Ante-scrotal urethral openings are by far the most difficult to close. The coverings of the urethra here are thin, possessing substance insufficient to furnish an amount of granulations adequate to close any but the most insignificant aperture. For the same reason, it is difficult to obtain from their immediate neighbourhood a flap endowed with sufficient vitality to preserve its existence after the process of transplantation. And further, owing to the extreme mobility of the member, it is difficult to maintain that perfect steadiness of position so desirable in a part which is the subject of an autoplastic operation; while the alteration in size and form which this organ is especially liable to exhibit, through the occurrence of erections which are often quite uncontrollable, may impair, or sometimes render almost impossible, the success of the best-planned and most skilfully-executed operation. Nevertheless, with all these difficulties, in addition to that formidable one, the contact of the urine before referred to, such openings, even when large, are not now by any means to be regarded as beyond the reach of surgical skill. The exercise of considerable tact, ingenuity, patience, and of unremitting attention during a long period of time, is indispensible on the part of the surgeon who undertakes to treat a case of penile fistula, requiring a plastic procedure for its cure; and some little resolution, with a good stock of patience, may be equally necessary on the part of the patient.

Openings in the perineum, involving loss of substance, or the contrary, although by no means easy to close, are remediable with less difficulty than those in the anterior part of the canal, and that on account of the absence of conditions which have been just adverted to, as constituting the more prominent obstacles in respect of the latter class.

It is within the last few years only that these distressing lesions have been rendered amenable to surgical treatment. Formerly they were regarded as amongst the opprobria of our art, and were abandoned as beyond its power. Generally speaking, some operative measure, which has for its object the transplantation of a flap of the neighbouring integuments to supply the loss of tissue at the opening, is necessary. In a few instances, however, where the openings are small,—cases, by the way, which are exceedingly rare,—this proceeding has been dispensed with, and their complete closure has been accomplished by other means. The attention which has during the present century been devoted in Europe to plastic surgery has greatly advanced our acquaintance with new means of remedying loss of the

soft parts in various regions of the body, and amongst those in none more materially than in that under consideration.

First, then, ante-scrotal fistulous openings which are of small size, but obviously depending upon loss of substance in some degree, have been closed by repeated applications of a caustic agent to their edges and to the surrounding parts. Sir A. Cooper records a case in his "Surgical Essays," in which he closed a fistulous opening of the size of a pea, and situated immediately in front of the scrotum, after the failure of two operations by the hare-lip and interrupted sutures, by the application of nitric acid "to the edge of the fistulous orifice and upon the skin, to the extent of three quarters of an inch around it." The process was repeated several times within the course of six or eight months, when the orifice was perfectly closed. Sir A. Cooper observes on this fact—"But still it is only in cases in which the skin is very loose, or the scrotum is forming a part of the fistulous orifice, that this plan would succeed, as, where the skin is tight, it would be scarcely possible to draw it together so as to produce its union."

In the same manner the nitrate of silver, or tincture of cantharides, rendered stronger than ordinary by evaporation, have been successfully employed in very small openings. Dieffenbach, who has devoted so much labour to the prosecution of reparative surgery, and has done so much to advance it in modern times, was in the habit of employing the latter agent in the following manner:—Having passed a full-sized bougie into the canal, he introduced a camel's-hair pencil dipped in the tincture referred to, and thoroughly applied it to the inner border of the opening. He repeated this three or four times in the course of twenty-four hours, and at the end of that time scraped out the loose cuticle raised by the blistering fluid. Action was excited on the raw surface by another application, and this process was repeated until the granulations were healthy, and bid fair to close the aperture. He tried on several occasions the introduction of a hare-lip pin, and also a single point of interrupted suture, after thus making raw or "reviving" the lining of the fistulous opening, but without success. The use of the irritant agent uncomplicated with the suture gave generally a better result. Subsequently he contrived a suture, which produced more successful results than any such method previously employed, to which he gave the name of the lace suture. (Schnürnaht.) His description of this was originally published in Dr. Oppenheim's Journal at Hamburgh, in a long paper "On New Methods of Cure in Cases of Unnatural Openings in the Anterior Portion of the Male Urethra." This paper was translated by Mr. Swift for the 'Dublin Journal,' and appears in vol. 10, 1836. Professor Dieffenbach has since illustrated the subject in his work on 'Operative Surgery,' published in 1845, from which, as well as from his earlier writings, the account of this proceeding here given is taken.

The operation of the lace suture is applicable to small fistulæ in

the anterior portion of the canal, and when the surrounding skin is supple and healthy. The margin of the unnatural opening, as well as the surrounding skin for a short distance, must be frequently touched, during the day previous to the operation, with the concentrated tincture of cantharides. Before proceeding to use the suture, the loose epidermis raised by the blistering fluid is to be removed by scraping, a sound introduced into the urethra, and made to pass below the opening. The operator is then directed to take "a small curved needle, sharp at the point, but not at its edges, with a stout silk waxed thread, and by means of a needle-holder to introduce it beneath the skin at about three lines from the border of the fistula." The point of the needle is to be carried deeply, but not into the urethra, and made to emerge at another point, about three lines from the margin of the fistulous opening. By three or four of these stitches, the thread is to be carried round the opening, until it finally emerges at the point at which the needle was originally entered. The thread, therefore, now lies deeply in the cellular tissue around the fistula, at about three or four lines distance from it.

The two ends are then to be drawn together gently and slowly, so as to tighten the thread, and gradually approximate the borders of the fistulous orifice until it is obliterated. Lastly, the ends are to be fastened by a knot, which, when fastened, sinks into the cellular tissue, and disappears. A piece of wet lint is to be applied to the part, the sound withdrawn, and the patient directed to pass urine, when requiring to do so, by the natural passage. In three or four days, the ligature may be divided, and drawn away. "Even," says Dieffenbach, "if the first application does not quite close the opening, this is rendered smaller, and the succeeding operation is easy, and certain to succeed."

Soon after the occurrence of the two cases recorded by Cooper and Earle in our own country, Delpech, of Montpellier, performed a urethroplastic operation, which he detailed in his work on Clinical Surgery. In this case there had been loss of substance in the perineum, and through the opening so formed all the urine issued. The borders were revived, a flap adapted from the groin, and fastened by interrupted sutures, and a gum-elastic catheter was retained in the bladder. On the third day the flap became gangrenous, and ultimately entirely sloughed. Subsequently some contraction of the orifice was induced by caustic applications, but the man was not much benefited by their employment.

The writings of Dieffenbach, which present us with a most complete systematic history of a large practical experience in the exercise of plastic surgery, including urethroplasty as an important division of the general subject, come next under review. This distinguished surgeon recorded many of his observations in the form of papers or memoirs, which were published at Berlin between the years 1829 and 1834, in four parts, and were entitled 'Chirurgische Erfahrungen.'

Many of his earlier experiences were failures, and it was only after a long and patient perseverance in the endeavour to test the value of various operative procedures that his efforts were crowned with success. Subsequently, the results of his practice were recorded in 'Oppenheim's Journal,' before referred to; in the 'Handbuch der Plastichen-Chirurgie,' by Zeis, published at Berlin in 1838; in his own work on 'Operative Surgery,' Leipsic, 1845; and, more fully still, in a volume devoted to plastic surgery, and dedicated to him by Drs. Fritze and Reich, published at Berlin also in 1845. From these sources chiefly have been selected the following modes of proceeding, as those which appear to have been the most generally applicable, and the most successful in their results.

In dealing with the antescrotal fistulæ which were too large to be remedied by the "lace suture," described in a previous paper—that is to say, such, for example, as would permit the introduction of a full-sized catheter—Dieffenbach tried the following method, and generally with but indifferent success. It is briefly given here because it formed the stepping-stone to a modification of the operation which was much more perfect in its results.

A large catheter having been introduced into the bladder, the rounded orifice of the fistula is converted into a lozenge-shaped one, by the removal of a small piece of skin above and below it, as indicated in Fig. 1 by dotted lines. The point of a fine scalpel is next to

Fig. 1.

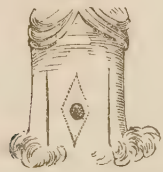


Fig. 2.

be carefully carried by successive strokes beneath the skin, so as to detach it from the subjacent structures for about half an inch in every direction round the opening, while the walls of the fistula are also revived. The free borders thus made are to be brought together by means of twisted sutures, in the median line, so as to cover the fistulous opening, as seen at Fig. 2. This done, two incisions through the skin are made, one on each side, to relieve tension. The catheter is to be retained for a few days, the end to be accomplished being the adhesion of the newly-opposed raw surfaces, which, if attained, closes in the fistula. In practice, however, it was found that the flow of urine by the side of the catheter prevented reparative action.

The result led Dieffenbach to add the following step to the operation. After the completion of the proceeding as far as already described, he next dissected beneath the skin, *at the outlying lines of*

incision, in the direction inwards—i.e., towards the fistula,—so as to completely detach the integument lying between the two incisions from the subjacent parts, thus converting it into what he terms "a bridge," for the purpose of permitting urine to escape from the fistulous opening at the lower extremity of either incision. This condition is indicated by the probe seen to be passed beneath the skin at Fig. 3. Although sometimes failing, this method may be regarded as

Fig. 3. Fig. 4.

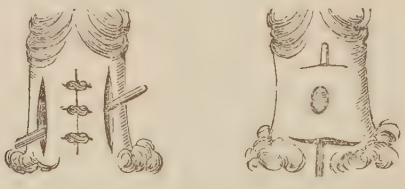


Fig. 3.—Dieffenbach's method, by "lateral bridges" and twisted sutures.
Fig. 4.—Nelaton's modification in the situation of the incision.

affording a very fair chance of success, provided that the aperture is not too large. It is based, as will be observed, upon the principle o bringing into contact, *not mere edges of thin tissue*, the adhesion of which cannot be expected to take place, but broad surfaces freshly revived, and maintained in apposition by light compression. It may be laid down, however, as a general rule, that success is not to be expected by this operation if applied to openings that measure more than the third of an inch in any direction.

A very slight modification of Dieffenbach's plan has recently been proposed and practised by M. Nélaton, of Paris, which consists in making the outlying incisions above and below the fistula, instead of laterally, as recommended by Dieffenbach. It is supposed that this affords a still better chance of permitting the free escape of urine. The first account of this method appears in the 'Gazette des Hôpitaux,' of Aug. 10, 1852; but a much fuller description is given in the same journal for March 28, 1854. The upper and lower incisions should be distant each about an inch from the fistulous opening, and the skin should be completely detached from the subjacent connexions, commencing at the borders of the fistula, the dissection being carried up to the incisions as well as in a lateral direction (see Fig. 4). Again, since the use of the twisted suture is sometimes attended with gangrene of the skin included in it, and the operation becomes sometimes thus defeated, it is proposed not to close the opening by any suture at all, but to permit it to contract by itself, at all events for a few days, when one or two pins, at most, will bring together the granulating surfaces, and enable union to take place in a few hours. A case is recorded in the journal already named, in which the last-mentioned plan of proceeding was successful in the hands of M. A. Richard,

who temporarily replaced M. Nélaton at the Hôpital des Cliniques in December, 1853, after no less than five preceding operative failures.

In cases where the deficiency was somewhat more considerable, Dieffenbach proposed, after making incisions according to his own plan by "lateral bridges" before described, but more extended, and placed further apart in proportion to the size of the opening, to bring together the borders of the fistulous orifice in the skin, not with a few points of twisted suture, as just advised, but with lateral leather splints. For this purpose, two strips of leather are prepared, about three lines broad, and rather longer than the opening to be closed, each perforated by three small holes, to permit a suture to be passed through. These are to be applied laterally to the two borders, previously raised and placed with their raw surfaces in contact, and the needles are to be passed through the holes in the splints and the two layers of skin together, so as to ensure perfect approximation and the contact of considerable planes of surface for adhesion. The author states that he has not yet made trial of this suggestion, but we shall find hereafter that it has been successfully employed by Mr. Le Gros Clark in our own country, with whom the idea of employing this means appears to have been perfectly original.

I had occasion to perform the operation described as M. Nélaton's modification of Dieffenbach's method by "detached bridges," nearly two years ago, in the case of a man who had lost a large portion of his urethra, amounting to fully an inch and a quarter of its floor and sides, anterior to the scrotum. He had previously been under my care for extravasation of urine, producing enormous sloughing, from which he fortunately escaped with his life, but with the mutilation referred to. When he had completely recovered, I proceeded according to the method delineated at fig. 4, by detaching the skin from its subjacent connexions above and below the fistula, as well as on each side. But this was too large an aperture to be successfully treated on this plan, and, with my present experience, I should certainly not adopt it. It is to be regarded as applicable only to openings which certainly do not exceed half an inch in length; nevertheless, there were some reasons in this case for selecting this operation, at all events for the initiatory attempt. First, there had been sloughing of the scrotum to a considerable extent, so that it would not be very easy to form a flap sufficiently large from that part, and in a suitable position for the purpose, at all events without including some cicatricial tissue in it, which it would be undesirable to do. Secondly, the surrounding skin of the penis was loose, abundant, and would easily supply the required flaps or "bridges." Thirdly, supposing the operation to be unsuccessful, the scrotum would still be in no worse condition to furnish a flap, should it be determined afterwards to attempt the cure by that method.

Without detailing the history of this case, I may say that it was

conducted strictly according to the plan adopted by Nélaton, detailed before; that the gushes of urine which would sometimes, in spite of all care, issue through the large antescrotal opening, broke up adhesions which, during the first three days, promised well, and caused gangrene of the flaps or "bridges," leaving the man ultimately in about the same, certainly in no worse condition than he had previously exhibited.

Shortly after this, I was witness of a precisely similar operation, performed by Mr. Erichsen in University College Hospital. In this case, there was two fistulæ, one perineal, the other ante-scrotal. The former had been previously treated with success by a plastic operation, and the second, the orifice of which was about the size of a pea, and situated immediately in front of the scrotum, was then submitted to the plan described, and the result, after two or three applications of lunar caustic, to close a very small aperture remaining, was completely satisfactory.—*Lancet, July 5 and Oct.* 4, 1856, *pp.* 9, 379.

81.—ON THE SOURCES OF DANGER AND FAILURE FROM URETHROTOMY BY EXTERNAL INCISION.

By James Syme, Esq., Professor of Clinical Surgery in the University of Edinburgh.

[Professor Syme maintains that the division of strictures by external incision may be performed with perfect safety; and in proof of this, he says, that, of all the cases on which he has operated, amounting to upwards of fifty, one alone has terminated fatally. Some of our metropolitan authorities have denounced the operation as dangerous and useless. In this lecture Professor Syme explains how a procedure so safe and beneficial may be rendered dangerous and hurtful. He says]

There can hardly be any serious or troublesome hemorrhage unless the artery of the bulb is wounded; and this may be certainly avoided by cutting in the middle line upon a grooved director. If the operator perversely chooses to make his incisions upon the convex surface of a silver catheter, or from inability to pass an instrument through the stricture, resorts to the desperate expedient of groping his way without a guide, he need not be surprised at the knife occasionally straying so far in a lateral direction as to cut the vessel which lies at the side of the bulbous portion of the urethra, in which case suppression of the hemorrhage by ligature will be nearly impracticable, while pressure, by impeding the escape of urine, will expose the patient to a greater evil.

If the stricture is not freely divided, or, still worse, left entire, while an opening is made into the urethra, between it and the bladder, as happens from the want of a proper guide, or the use of a blunt knife, which pushes the dense textures before it without cutting them, the patient will be exposed to almost inevitable extravasation of urine, of

which the effects will depend upon the part concerned. If it is anterior to the bulb, suppuration and sloughing, with a corresponding degree of constitutional disturbance, may be expected; and, if it is further back, its consequences may be not only distressing, but fatal. On the same principle may be understood the mischievous effect of allowing one or more strictures to remain undilated or undivided anteriorly to that which is the subject of operation. Another source of mischief is entering the knife into the groove of the director before the urethra is sufficiently exposed, since the incision of its coats is thus apt to be rendered *sub-cellular*, if I may use the expression; so that although the stricture is freely divided, and a passage afforded to instruments of the largest size, the finger cannot be brought into contact with the director or catheter, and the patient is exposed to nearly the same danger that would attend an internal incision.

However carefully and accurately the cutting part of the operation is performed there can be no safety unless a free drain be provided for the discharge of urine; and for this purpose, a full-sized catheter usually proves sufficient, but not without great care in its management. In the first place, as it must be tied in, so as to prevent displacement, it should be metallic, and not flexible: since, if of the latter kind, it would not be under the certain restraint requisite. Instead of numerous small apertures, which are apt to become obstructed with blood or mucus, there should be one or, still better, two large "eyes," and they should be maintained firmly within the cavity of the bladder. The other extremity of the instrument should be curved downwards, so as to let the urine fall into a vessel placed below it, without dribbling and wetting the bed clothes. But the stopcock, which I added still further to promote the patient's comfort, is productive of so much danger, especially in unskilful hands, that it had better be omitted. In hospitals, where the attendants are conversant with the process of treatment, reliance may be placed upon the stopcock being regularly turned, so as to evacuate the bladder from time to time, according to circumstances; but in private practice it frequently happens that the persons who are charged with this duty get so confused as not to know whether the catheter is open or closed: and if the patient should unfortunately make expulsive efforts in the latter state of matters, it is plain that his condition will be much worse than if he were altogether devoid of an instrument for allowing the urine to escape. But even when this great source of danger is obviated by proper care, the presence of a stopcock may be productive of harm; since if the bladder, after gradually yielding to the distension which the accumulation of its contents produces, is suddenly allowed to evacuate itself, the contracting force greatly exceeds that of the resistance which was previously exercised, and the urine rushes out so hastily, that, instead of quietly taking the channel afforded by the catheter, it also passes along its outer side, and may thus enter the textures exposed by the wound. I therefore think that the catheter should be kept open, so as to prevent

any greater expulsive force than the simple resistance to distension which is opposed by the coats of the bladder. I would also beg to warn against allowing any change of posture during the forty-eight hours which elapse after the operation, since the effect of this may readily be a displacement of the catheter quite sufficient to produce the most serious complications of an otherwise promising case. The patient should remain quietly on his back, with a pillow under his knees, recollecting that the period of restraint is limited, and that any little irksomeness connected with it will be amply recompensed by accomplishment of the object in view. It is not desirable that the wound of the urethra should heal by the first intention, or that the edges of the integuments should unite in the first instance; since the patient, in the former case, would be exposed to a relapse of the disease, and in the latter, to the dangers which attend incisions made from the interior of the canal. The surgeon, therefore, should occasionally introduce his finger so as to feel its point fairly touch the instrument, unless the escape of urine renders this precaution unnecessary, by showing that the aperture remains open. One of the principles which I have been most desirous to impress is, that strictures do not occur posteriorly to the bulb except in some cases of the most extreme rarity; so that, with such exceptions, incisions into the membranous portion of the urethra are altogether unwarrantable. But as the erroneous ideas which have existed on this part of the subject, supported as they still are by some living authorities of more or less weight, cannot be expected to disappear all at once, I may further remark that the danger of extravasation will be especially serious when the urethra is laid open so far back as to divide the deep fascia of the perineum; and when this has been done, either through the mistake in question or for some legitimate purpose, such as the extraction of concretions, I would beg to suggest the employment of a straight tube, such as that used after the operation of lithotomy, which may be introduced with perfect facility through the wound, and will effectually prevent the risk of such serious consequences as would result from the catheter ceasing to discharge its duty.

The principal sources of failure in affording complete and permanent relief by the operation are imperfect division of the stricture, and want of due care to introduce instruments during the process of recovery. In some cases, the contraction resembles a narrow ring, but it not unfrequently occupies a larger extent of the canal, which is also apt to be narrowed into a conical form on each side, so that to make sure of accomplishing the object, instead of merely allowing room for the passage of an ordinary catheter, the operator should expose from one to two inches of the director. It is impossible to lay down any precise rule in regard to this point, and experience alone can regulate with anything approaching to certainty the proper length of incision in each particular case, but as it is always best to err upon the safe side, a free use of the knife should be preferred to one of a more limited kind. The

operation has been characterised by a metropolitan authority as a "niggling procedure," but I hope to be pardoned for remarking that it is not so necessarily; that when properly performed it is executed with no less dispatch than decision; and that when done in a *niggling* way, it can hardly be expected to produce a satisfactory result. As to the after-treatment, it should be remembered, that whenever the urethra is injured by external violence, as from falls or blows upon the perineum, even although there may be no actual laceration of its substance, a stricture is very apt to ensue, if full-sized bougies or catheters are not introduced occasionally for some time afterwards. It is therefore, not surprising that if this precaution be omitted, after the canal has been slit open at one or more points of its extent, contraction of the injured part should follow.

Having now explained not only how the operation ought to be, but how it ought not to be, performed, and fully stated every circumstance that seems calculated to interfere with success, I venture to hope that the future results of its performance will be no less satisfactory in the hands of others than they have been in my own.—*Lancet*, *May* 10, 1856, *p.* 523.

82.—RETENTION OF URINE FROM STRICTURE.—SYME'S OPERATION.

[In a case lately operated on by Mr. Lane, at St. Mary's Hospital, the patient had received an injury to the urethra in the perineum some years before, which was followed by stricture and fits of retention of urine. In one of these attacks, on examination by Mr. Lane,]

The constricted, or nearly obliterated portion of the urethra extended for two inches in length; so that, in order to relieve the man of the agony of retention of long standing, it was found necessary to open the membranous portion of the urethra behind the stricture, as recommended by Guthrie and Liston, when a large quantity of urine was drawn off, to his inexpressible relief. It was next found—whether from the rest in hospital, the warmth and relaxing effects of confinement to bed, the subsidence of congestion and spasm, so often observed, or the strain taken off the bladder, or the irritation of the instruments lessened, which were withheld for some days, or perhaps from all these causes taken together—after he had been a week or ten days in hospital, that Mr. Gascoyen, the house-surgeon, was able to pass an instrument through the strictured part and through the old wound in the perineum into the bladder. Indeed, Mr. H. Thompson finds this is almost always possible under such circumstances.

August 1st. Mr. Lane to-day, as the wound of the operation was still open, proposed to lay the two parts of the urethra into one. With that object in view, after chloroform was administered, he passed a grooved staff, then cutting very carefully in the median line, cut upwards towards the contracted or strictured portion of the urethra,

and then subsequently passed a large instrument on into the bladder to be left there permanently for some days, secured in the usual manner by plug and pieces of tape.

This case is instructive, as puncture of the urethra at its membranous portion, which is not often seen in the east end hospitals, was preferred to puncture through the rectum—apparently not so good an operation, as the instrument slips out again and again, and new punctures have to be made in the rectum; whereas puncture anterior to the verumontanum—the latter acting the part of a valve—is followed by more favourable results. This portion of the urethra, also, is easily reached by the surgeon, being covered merely by a sheath from the deep perineal fascia; the line of incision, if carefully made in the middle line, separating some fan-like expansions of the compressor urethræ (Guthrie's and Wilson's) muscles, which meet at the *raphé*. It is necessary to hit off with microscopic accuracy the delicate line of the *raphé*: no simple dashing cut in the perineum will do; for if we cut sideways through the muscles the wound will be found to gape open, and there will be hemorrhages and, possibly, extravasations of urine between the two layers of the deep perineal fascia, extending upwards as far as the pelvic fascia, and downwards to the side of the rectum, with those troublesome, if not fatal results of infiltration of urine, so often seen in hospital practice. An additional point in favour of this operation of Mr. Lane, according to the experience of the west end hospitals more particularly, is that about the fourth or fifth day of bad retention of urine, the membranous portion of the urethra becomes dilated, and is easily reached; whereas in the operation by puncture above the pubes, we may not reach the bladder at all. In that of puncture of the rectum between the vesiculæ seminales, and so near the peritoneum, we may cause abscesses, or disease of the rectum itself, and the instrument has a tendency to slip out, while in both these temporary expedients the original stricture remains uncured, or nearly so. Another point of no little importance Mr. Lane conceives, is that the membranous is perhaps the most fixed portion of the canal.—*Association Medical Journal, Aug.* 30, 1856, *p.* 735.

DISEASES OF THE EYE AND EAR.

83.—ON SOME AFFECTIONS OF THE CORNEA.

By S. Browne, Esq., R.N., Surgeon to the Belfast General Hospital, &c.

[The structure of the cornea, although it appears to be a simple homogeneous membrane, clearly consists of five separate tissues or laminæ, viz., the conjunctival layer of epithelium, the anterior elastic lamina, the cornea proper, the posterior elastic lamina, and the epithelium of the aqueous humour. The first disease to which we

shall refer is chronic thickening of the epithelial layer, the result of conjunctival inflammation, especially purulent ophthalmia, and is frequently accompanied by what is called the granular lid. It may also arise from strumous inflammation of the conjunctiva, and is then often associated with disease of the Meibomian glands and the hair follicles of the cilia.]

In all cases where the conjunctiva becomes engaged in chronic inflammation, and the disease remains for some time unchecked, the cornea is very likely to participate in the morbid action, by having its epithelial layer, and, perhaps, its anterior elastic lamina, sooner or later involved. No matter how the affection of the epithelial layer has arisen, it produces the same injury, at least temporarily, to sight, and that it does by simply, in the first stage, interposing an opaque barrier to the transmission of light; then, after some time, the opacity likely spreads to the anterior elastic laminæ, as may be observed in a case of some standing, by scraping off a small portion of the epithelium, when the elastic lamina will be seen muddy or slightly milky in its appearance. Sometimes the epithelial layer becomes thickened and injected; to this state the name of "pannus" has been given; this usually, I may say always, occurs either as the immediate result of active inflammation of the part, or is superadded inflammation to an already thickened and injected condition of the layer. The treatment which I have found most successful in these cases I shall now relate. My first care is to ascertain the exciting cause of the corneal affection; if it depend upon a hypertrophied state of the palpebral conjunctiva, I direct my attention first to the cure of that condition, for, so long as the rough, hard surface of the eyelid is pressed and continues to rub against the front of the cornea, we must have the epithelial layer vascular, and day after day becoming more opaque, just as in entropium the same results occur from the irritation of the inverted cilia; in fact, this vascular action in the part is seemingly set up as a protective measure; for the patient, in the early stage of either "granular lid" or entropium, suffers great torment from the presence of what must be regarded as a foreign body, but, after a time, the thickened layer becomes less sensitive, until the pain is almost disregarded; but then, along with this lessened sensibility, sight has become more and still more dimmed. But, to return—when I find that the corneal affection is accompanied by a hypertrophied state of the conjunctiva, I adapt my treatment accordingly; as a local application I use sulphate of copper; I take a piece, and having ground it quite smooth, I affix it to a quill; with this I freely rub the inside of the eyelid or lids that may be implicated, applying it to the part for fifteen or twenty seconds; this I repeat every second or third day; at the same time I order the ointment of the red oxide of mercury, made very fine and smooth, to be introduced within the eyelids every night. I occasionally, also, advise the use of collyrium, composed of the sulphate of alum or zinc, four

grains to the ounce of water, along with the sedative liquor of opium, half a drachm to the ounce. Of course I do not confide in applications alone, as I hold that in all such diseases we must endeavour to correct the vitiated state of the system upon which, in the great majority of cases, the local affection depends. Now as the disease under consideration is one of an asthenic character, I never think of depletion unless in those cases where active inflammation sets in, and then three leeches to the inner canthus of the eye every night, for two or three in succession, will suffice. Alteratives and tonics are the medicines I find most efficacious; of the former, mercury and iodine are my favourites; of course I use others occasionally; of the latter, the preparations of iron stand highest in my estimation. But it must ever be remembered that the regimen, clothing, sleeping apartments, exercise, in fact, hygienic medicine and sanitary requirements, cannot be overlooked; nay, these are most essential, and many cases, no doubt, fail to be cured, in consequence of these seemingly simple means being lightly esteemed. The eye-douche, in some of these cases, I have found of great service. Mr. Walton's douche is a very simple, cheap apparatus, and with it a stream of cold, warm, or medicated water, can be directed full on the affected part, without causing any pain. We must not expect, in the cases under consideration, to effect a very speedy cure, for, as the disease is one of morbid action, producing a greater or less change of structure, time, of course, will be required along with the best chosen remedies to restore the altered structure to its normal condition. But I am pretty certain that a steady perseverance in the treatment—or the like—which I have suggested, will eventually remove the complaint, unless where the disease has been of long standing, causing irreparable change of tissue, or is so complicated with some other disease as not to afford much prospect of success: these cases, however, are easily recognised.

The next disease of the cornea to which I shall beg attention is ulceration of any or all of its component structures. On the margin, and occasionally scattered over the surface of the cornea, we frequently see points of ulceration of the tissue we have just had under consideration—ulcers, in fact, of the conjunctival layer; these are usually attended with many large tortuous vessels running into their edges, and present a dirty irregular appearance, deep, seemingly, from the thickening of the tissue around them. Now, although they present a very alarming appearance, enough to frighten the inexperienced into the use of most active measures, they are in truth very tractable, and readily yield to one or two touches of the solid nitrate of silver, the application of a simple astringent, sedative collyrium, and the internal administration of one or two corrective purgative doses of rhubarb and carbonate of soda, combined with some tonic. But when the ulceration extends deeper, the case becomes materially altered; and here I may observe, that the deeper in the structures of the cornea any ulcer proceeds, by so much is the danger to the integrity of sight

increased. Ulceration very frequently is seen to extend through the epithelial tissue and attack the fine dense structure of the anterior elastic lamina; this ulcer presents an even surface on its bottom, with a sharp, well-defined edge; from the thickening of the epithelial layer the ulcer looks deeper than it really is, for it is certain that the real depth must be trifling, as the membrane in which it is situated is so very thin. If this ulcer be seen in its early stage, it can be readily arrested in the majority of cases, and, when healed, leaves no trace behind, save occasionally a slightly hollowed surface, but which is quite as transparent as the adjoining tissue. I believe I was among the first to point out this fact, that if ulceration of the cornea do not pass through the anterior elastic lamina into the lamellated tissues, the reparative process will not leave any trace of opacity; but if the laminated structure have been affected, the healing will present a cicatrix of greater or less density in proportion to the depth and extent of the ulceration. I was first led to the foregoing inference, from observing the healing of the injuries of the anterior elastic lamina after a foreign body had been "gouged" out of its structure, and seeing that no trace of the hurt could be detected after the lapse of a few weeks, or, at most, months; and I believe the fact is now admitted by all who have taken the trouble to make the observation. It is an admirable provision, for if this part of the cornea, which is so liable to injury, were rendered opaque thereby, many eyes must be annually materially impaired amongst the working classes. Sometimes I have seen the ulceration of this tissue commence at a point of its coalescence with the sclerotic, and extend around a large portion of its margin, leaving the part standing out and detached, the lamellated structure being laid bare for a line or more in breadth, yet the part has healed up without leaving a trace of the lesion. When the ulceration reaches the lamellated structure, the bottom of the sore will present a very irregular surface, until healing commences, when the bottom of the ulcer will become clear and level, and the edges will have a less sharpened appearance. It does not follow that because the ulcer has exhibited this uneven surface it must have an opaque cicatrix, for it may be that the ulceration has only just reached the lamellated surface where it becomes united to the anterior elastic lamina; if so, the probability is, that the healing process may be accomplished by means of transparent tissue. Tonics, locally and internally, are the means I use. I apply the nitrate of silver by impregnating the fine point of a camel-hair pencil with a saturated solution of the salt, and then gently touching the ulcerated surface; this I repeat daily, or every second day, according to circumstances One effect soon observed is the diminution of pain in the affected part, for as soon as the smarting of the application has passed off—in some half-hour in most cases—the acute aching sensation which had been felt in the eye and brow is greatly diminished, and the patient will enjoy—probably for the first time for several nights—

refreshing repose. In the dispensary I usually give Dover's powder, five to ten grains, or according to age, with two or three of calomel every night, and ten grains of powdered Peruvian bark, with ten of carbonate of soda, twice or thrice daily; frequently, also, I give the sulphate, or the ammonio-chloride of iron, along with the foregoing. Now these cases should be anxiously watched, for if the ulceration be not arrested, it gets into the areolar structure of the lamellated layers, and then likely runs a rapid and injurious course. Inflammation spreads to its texture, and lymph is either quickly deposited in its tubular spaces, or sloughing ensues: in the one case the sight is greatly endangered, in the other, almost certainly lost. Sometimes pus forms in the lamellated structure—a very dangerous result of the inflammation. Where the disease has reached the lamellated structure, and the inflammatory action becomes more active, threatening the changes which I have specified, local depletion becomes necessary; yet still the tonic treatment also should not be abandoned; of the happy results following a tonic and stimulating treatment, along with local depletion, I have had many examples; and, apparently anomalous as it may seem, I have repeatedly found leeching and the local application of nitrate of silver of the greatest utility; but then the fact is, that nitrate of silver is not an irritant, as supposed by many, but is a direct sedative, allaying the exalted sensibility of the part,—and of this the eye affords beautiful examples in the inflammations of its superficial structures. The same, I may add, is seen in simple phlegmon and erysipelas of other parts. When the cornea shows the least tendency to sloughing, I cannot too earnestly caution against the use of mercury, so, at least, as to produce any of its specific effects. It may be advantageously given, however, in some cases, in tonic doses, the eighth or twelfth of a grain of bichloride combined with decoction of bark, but it must be watched. I believe, indeed, that in most cases, so long as the appearance of sloughing remains, the mercury had better be withheld, and bark, soda, and iron, be substituted. There cannot be a question, however, that mercury, especially its bichloride, exerts a most powerful remedial agency in removing many of the opacities of the cornea which remain after the inflammatory action has ceased. Of this I shall have occasion to speak presently. Nearly a century ago Dr. Meade pointed out the efficiency, especially of the bichloride, of mercury, in removing certain opacities of the cornea. If matter form within the layers of the lamellated cornea, it must not be interfered with manually, but be left to be removed by absorption, or by finding its way to the surface, or into the chamber of the aqueous humour; any attempt at giving exit to it will only excite fresh inflammation, and the pus cannot be evacuated by the knife. One thing is certain, that when suppuration has taken place in the areolar tissue of the lamellated structure of the cornea, the integrity of vision is greatly endangered; for, at the least, the reparative process will leave an indelible opacity by the formation of opaque,

white, fibrous tissue, and if this be central and extensive, the sight will be, as it were, blotted out. Of this, one sees many examples among the inmates of the various asylums for the blind. In these institutions, in the great majority of cases, opacity of the cornea will be found to be the cause of blindness, and that has been produced by purulent, or gonorrhœal, or variolous inflammation, neglected, or improperly treated; in all of these the nitrate of silver, early, freely, and judiciously applied, would likely have arrested the destruction.

In purulent and gonorrhœal inflammation, every one conversant with ophthalmic practice, and who is not morally blind to truth, is aware that the nitrate is all-powerful in arresting their destructive tendency. Fortunately, we are not often called on to treat variolous ophthalmia; but let me assure my readers, that eyes need not generally be lost when attacked by the variolous pustule. The nitrate of silver, freely applied to the conjunctiva, when, in the patient labouring under small-pox, it is attacked with inflammation, will not only prevent the formation of pustules, but will arrest the development of any that may have formed; and the profession is aware that, in these cases, the usual result was, that from the pustules forming upon the cornea, the inflammation extended through the anterior elastic lamina, or completely destroyed all the corneal texture. In the former instance, the loss of sight arose from the formation of a white, firm cicatrix—in fact, an indelible leucoma, in the latter, from the collapse of the entire globe of the eye. I may remark, that I lately felt great gratification in reading the report of two cases of purulent or gonorrhœal ophthalmia—it matters not which—as they are very much alike, differing principally in degree of severity. These cases are reported from a lecture delivered in one of the London hospitals by a distinguished surgeon, who has been a great advocate for active depletion in all acute ophthalmias. In one of the cases, his old and favourite practice of depletion, *ad deliquium*, was vigorously pursued, along with mercurialization: the eyes were lost! In the other case it is stated that a very different treatment was pursued, and with more successful results! Now, while this gentleman has been tardy to admit that the practice he inculcated and pursued for many years is and has been wrong, still it is gratifying to perceive that he is likely to be converted in his declining years, and that he admits that all ophthalmic inflammations cannot be cured by active depletion! I trust, indeed, that he will live to confess and insist that the majority of superficial inflammations of the eye are best treated by a very opposite line of practice.

In that form of inflammation of the conjunctival corneal layer named "pannus," and where there is not granular lid as the exciting cause, a great variety of remedies have been suggested—some of a character which we are not likely to try in this country; for instance, inoculation of the eye with gonorrhœal matter. We are satisfied with less dangerous and less heroic measures, and usually find that local and general

tonics, persevering'ly employed, along with small doses of the bichloride of mercury, will remove the disease. The eye-douche, used with cold, warm, or medicated water, will often contribute much to the restoration of the eye to a healthy condition. In some very bad cases I have tried a new method, namely, lifting up small portions of the conjunctiva all around the margin of the cornea in loops, and passing a very fine ligature beneath each portion, tying the several points, cutting them off quite close, and thus destroying the series of enlarged vessels which supply the thickened epithelial tissue. This operation, if chloroform be not exhibited, requires a patient with great powers of endurance. Of its success I can now speak satisfactorily, as, in two cases I lately treated by ligature, the progress has been rapid and gratifying. In this treatment, if fresh inflammation be excited to an *over* degree, it will be necessary to apply leeches and other antiphlogistic measures. In speaking of ulceration of the cornea, I omitted to state that frequently the ulceration extends through all of its tissues until it becomes a penetrating ulcer: all the structure has then been ulcerated through, and the iris falls into the opening; or the posterior elastic lamina still remains, this yields to the pressure of the aqueous humour, and bulges into the aperture, and is likely followed by the edge of the iris.

Now, if this penetrating ulcer be situated near the centre of the cornea, the treatment I adopt is quite different from that which I follow if the opening be near its circumference. In the first instance, I drop a solution of sulphate of atropia—six grains to the ounce of water—upon the conjunctiva, and smear extract of belladonna upon the eyebrows; after some fifteen or twenty minutes, I endeavour, with a fine probe, to free the margin of the iris from the aperture, and thus, promoting dilatation of the pupil, I prevent the occurrence of synechia anterior, and a likely consequent closure of the pupil; but, in the other instance, I am satisfied to free the iris from the ulcerated opening, without applying any belladonna. For, in the first instance, I wish to draw away the margin of the pupil from the opening; and, in the other, by exposing the eye to a strong light, and thus contracting the pupil, prevent it falling into the aperture. In either case I touch the ulcer with a fine point of solid nitrate of silver, or with a camel-hair pencil charged with a saturated solution of that salt. Some authors condemn the use of the nitrate of silver in these cases: I can only say, that I have followed the practice I state in a very large number of cases, and with the best results: in fact, in these instances I consider the nitrate is invaluable in preventing further ulcerative progress, in promoting new action, and in hastening the reparative process. Of course, the practice I here recommend must be adopted *at once*: for if the iris have been in contact with the ulcer for a period of a few hours, adhesive inflammation will have glued the one to the other, and any attempt then to separate the parts can only be productive of mischief.

I shall now briefly refer to a peculiar inflammation of the cornea, usually occurring in persons of a strumous habit, and about the age of puberty, sometimes in childhood. In this disease, without much previous vascularity of the conjunctiva, but with the well-marked areola of vessels, which in all deep-seated inflammations of the cornea or iris surrounds the corneal margin, the cornea quite suddenly becomes milky in hue, while the epithelial tissue is nearly unaffected, and the anterior elastic lamina retains its polish and seems clear; in fact, the opacity is evidently in the lamellated structure. Now, whether this depends upon the effusion of fluid into the tubular spaces of the cornea, or is merely a derangement of the elementary parts of its structure, is not quite clear: I think it is owing to the effusion of some fluid. It is true, indeed, that a perfectly fresh and transparent cornea can be rendered opaque by pressure, but it regains its brilliancy the moment the pressure is removed: this opacity depends upon the disarrangement of its integral particles; but, in disease, although the opacity appears very rapidly, and, as I have stated, without much previous signs of inflammation, its removal is a very tedious matter, not being usually effected under many weeks, sometimes several months. Besides, in some very bad cases which I have seen, the corneal structure was evidently swollen, approaching slightly to the appearance of the cornea in an eye that had been macerated in water, and had imbibed some of the fluid by endosmose. This is probably from the effusion of colourless serum, or from an increase in the exhalation which usually moistens the areolar tissue of the lamellated structure. There cannot be any question that lymph, also, is sometimes effused; and I have occasionally seen blood filling up the tubular spaces of the cornea. One peculiarity about this disease is, that there is often great intolerance of sight, while the cornea is so opaque that it presents more the appearance of ground flint glass, with the polished surface in front, than any other material. The opacity is so great that the person can only distinguish light. This intolerance of light is pathognomonic of ophthalmia occurring in strumous habits, and is very observable in scrofulous children. Every one is aware of the dread photophobia which exists in some of these cases, and where, upon examination, no structure of the eye can be said to be inflamed, the conjunctiva, in many cases, being almost without vascularity. The exalted sensibility which is present without inflammation, the contracted pupil, the gush of tears, and the sneezing, which are observed when the eye is exposed to a strong light, constitute a nice question in pathology and physiology, which, however interesting, the scope and tenor of my paper will not permit me to discuss.

I have remarked, that in this species of corneitis there is not, at first, any sign of active inflammation, yet there is no doubt that the corneal vessels are injected, in the first instance, with colourless blood, from which the effused fluid proceeds, and, if the disease be not arrested, very marked signs of inflammatory action soon arise, such as

conjunctival injection, a deeper and darker zone around the cornea, spots of deeper opacity scattered through its substance, which I take to be coagulable lymph; and, finally, red vessels may be seen passing behind the anterior elastic lamina.

This disease very rarely attacks both corneæ at the same time, but it is quite certain that within some weeks or months the second eye will be attacked, and that, frequently, while the first is under treatment: in some hundreds of cases I have never found this observation fail to be realized! In fact, so convinced am I now that the second eye must take on the diseased action, that I invariably state to my patients what they must expect. In some cases, I had begun to doubt at the end of six or eight months; yet, after the lapse of that time, the prediction has been verified. It is an anomaly in eye disease: the why and wherefore I do not pretend to explain.

With regard to treatment, this is one of the few forms of ophthalmia in which I deplete freely—locally, I mean. Four or six leeches should be applied to the eye every, or at least every second, day; for although there may not be signs of active inflammation, for the reasons I have already assigned, I find it absolutely necessary to stop *in limine*, if possible, the morbid action. I will not say that otherwise the eye may be lost, but I feel assured it is the only way to insure anything like a speedy and satisfactory cure. I always, in these cases, exhibit mercury so as to gently affect the system, combining it with either Dover's powder, or some James' powder, or the tartrate of antimony along with quina. When the intolerance of light has diminished, the vascular zone lessened, the conjunctiva has become less vascular, and the opacity of cornea is not so dense, I consider that the first, or acute stage, if you will, has passed away, and I commence to give the iodide or bromide of potassium, still, however, exhibiting *tonic* doses of the bichloride of mercury. I am not sure that blistering is of great use, still. I generally order one to the temple of the side affected, and keep up the issue with Albespeyrre's paper, No. 2. When all trace of inflammatory action has disappeared, and we have only the opacity—but lessened, of course—remaining, the ointment of the red oxide of mercury may be put within the eyelids every night, and a solution of the iodide of potassium, containing from 10 to 20 grains to the ounce of water, may be dropped on the conjunctiva morning and midday: and here I may remark, that this solution, used thus daily for some weeks, I have seen remove the olive-coloured stains which had been produced in the eye by an improper and injudiciously continued application of nitrate of silver drops! If, in the affection under consideration, the lower eyelid exhibits dusky-coloured and enlarged vessels in its conjunctival lining, as it often will, this surface should be lightly touched with smooth nitrate of silver, or rubbed with a fine piece of sulphate of copper, so as to restore tone to the dilated and atonic veins. The eye-douche will here, also, be found very serviceable in promoting a similar end; in fact, tonics, both internally and externally, are indis-

pensable essentials in the treatment of this affection when it has reached the chronic stage. The preparations and compounds of iron and iodine are the best tonics for internal exhibition. With regard to the influence of mercury in this species of corneal disease, I beg to say that I have a very decided and favourable opinion. Some persons may suppose that this drug is not admissible in an affection so frequently, perhaps always, occurring in a strumous habit; and, doubtless, the objection would be valid, were it requisite to give that metal in large doses, so as specially to affect the system; but I do not believe that, in the manner in which I exhibit it, the smallest evil can ensue; on the contrary, my experience is, that, in minute doses, mercury is an active and very safe tonic, and certainly most effective in removing the opacity of structure which remains after the active stage of the complaint under consideration has passed by.

The only other affection of the cornea to which I shall in this paper allude, is inflammation of the posterior elastic lamina—the membrane of Desmares. This part is less frequently found the seat of disease, than the more superficial and lamellated structure: here, as in all corneal inflammations, a vascular zone surrounds the margin of the cornea; in this instance the zone is of a deep dusky hue, while the general conjunctival tissue is usually but slightly affected; there is a deep-seated opacity, frequently of a dirty yellowish colour, and always interspersed with small spots presenting a denser opacity than that in the tunic generally. In this affection, the iris and ciliary body may soon become implicated in the inflammatory action, when the anterior chamber of the aqueous humour exhibits a muddy appearance, the pupil is contracted and irregular in its margin, and the vascular zone extends very much in its breadth, while the situation corresponding to the attachment of the ciliary body, assumes a bluish tinge, such as we see in a chronic congested condition of the choroid coat; indeed, in cases where the inflammation runs a rapid course, and is unchecked in its progress, the choroid tissue itself becomes affected, and it is obvious that such is most likely to ensue from the continuity of structure that exists in the membranes under consideration. Some of the results of an aggravated attack of these structures, which I have seen, were, a permanently irregular pupil, a discoloured iris, and a constricted appearance of the eye immediately around the margin of the cornea, arising from the contraction which had taken place in the tissues of the ciliary body, while a diminution or loss of the adjusting powers of the eye, with a consequent failure of vision, naturally ensued. I cannot say that I have seen any permanent opacity of the corneal structure remain after this peculiar inflammation; for although the tissue may have presented a very dense opacity of a dusky hue, along with the speckled granular appearance to which I have referred, I have always seen it resume its transparency after the inflammation had entirely passed away.

In the treatment of this disease I consider it absolutely necessary

to exhibit mercury so as rapidly and certainly to affect the system, and I think the action of the mercury should be sensibly kept up until the inflammatory condition has yielded, and the tissues begin to resume their natural appearance. With the mercury I usually combine tartar emetic and opium. From the nature of the structures affected, and the rapidity with which they exude lymph, I think it will be readily conceded that mercury is *the* essential in the treatment of this complaint, and that, without it, structural change, likely of very serious moment to vision, would probably arise. I cannot say that I have found active local depletion of any very great use as a curative measure. Should, however, the attack be attended with much supra-orbital pain, or a sense of heat and fulness in the eye with vascular injection of the conjunctiva, a few leeches may with great propriety be applied above the brow and over the course of the angular vein. In the chronic stage counter-irritation on the temple will be found very useful. Extract of belladonna, applied freely over the eyebrow, as in ordinary iritis, I always order during the progress of the malady, and I may say that I deem its constant application of no small importance, both in allaying the irritation that usually exists, and in keeping the pupil dilated.

It must not be supposed that, in speaking of the inflammation of the several tissues of the cornea, I mean to convey the idea that these are always thus separately engaged in disease from the outset. On the contrary, I have in numerous instances seen all parts of the structure apparently attacked with inflammation from the first, though it is very difficult to determine whether the posterior elastic lamina always participated in these attacks, because, when the more superficial layers become engaged, and are of course opaque, it is impossible to ascertain the condition of that lamina. The obscurity of its state, however, need not be regarded as of any great practical moment, as the treatment should, in every instance, be such as to secure for the deep portion of the cornea, and its associated structures, remedial agencies that are known to arrest the morbid action of these parts.

I have already stated, that I have observed several cases of corneal inflammation where the entire structure was apparently affected at once. The conjunctival layer in these cases was deeply injected in irregular patches near the margin, the enlarged vessels giving these patches a deep red hue; behind this membrane the anterior elastic lamina could be observed semi-opaque, with the appearance of the polished side of ground glass, and within it several points of denser opacity more deeply seated, caused by deposition of lymph in the lamellated structure of the cornea proper; in some instances, a few days after the commencement of the attack, I have seen tortuous vessels, carrying red blood, pass behind the elastic lamina and enter these dense spots in the lamellated tissue. Here, then, there was evidence of three of the layers of the cornea being attacked, and

there is every reason to suppose that the fourth, or posterior elastic lamina, was not free. In all of these instances, I may remark, that there was a broad vascular zone, of a deep hue, around the cornea, and for about two lines out over the sclerotic, with considerable conjunctival injection; the former of which signs led me to suppose that the posterior elastic lamina, with the iris and ciliary body, was more or less affected.

There cannot be a question but that, where the structure of the cornea is so seriously implicated, there is great danger to the integrity of the eye from permanent opacities remaining within its corneal substance, resulting from the repair of small suppurated points, or from organized lymph deposits; or synechia anterior may take place in consequence of the union of the margin of the iris to an ulcer in the posterior elastic lamina, formed by the penetration of pus into the anterior chamber, and thus the pupil may be nearly or entirely closed.

Seeing, then, that any or all of these results may follow inflammation of the entire corneal structure, it is clear that active measures are called for in its treatment; but while I say so, I do not mean that it should be inferred I would either recommend or pursue the extravagant depletion which I have seen practised some twenty years ago. But I would certainly advise active local depletion, by the application of six or eight leeches over the brow, or near the outer or inner canthus of the affected eye, every, or every second, day; as to opening the temporal artery, or the more needlessly painful operation of cupping the temples, I would never dream of such. Besides the leeching, I always order small doses of calomel combined with minute portions of tartar emetic, and moderate ones of opium, or give the calomel along with Dover's powder. As a local application I usually direct a collyrium, having astringent and sedative qualities, to be freely used either cold or warm, as may seem most agreeable to the feelings of the patient; remembering, however, that in the winter season cold applications are very likely to cause an increase of pain in the brow. While using the collyrium, I always advise the application of extract of belladonna, as I have already mentioned, or add the expressed juice of belladonna to the collyrium.

When, under this treatment, steadily pursued, the active stage of the inflammation has passed away, I content myself by exhibiting the bichloride of mercury, in the way I have already pointed out, and by applying an issue blister to the temple. Being satisfied that time is the great element in the restoration of the organ, I am not sure that any local application will much hasten the cure, though I have used the solution of the iodide of potassium, dropped daily on the conjunctiva, with seeming advantage. Should I find thickened vessels in the palpebral conjunctiva, keeping up superficial irritation, I would apply the nitrate of silver, or sulphate of copper, as I have already described, with the view of restoring healthy action in the

relaxed and atonic blood-vessels of the mucous membrane, and would order the eye-douche of cold water with a like intention.

I have now, I believe, glanced at the nature and treatment of the most common and important affections to which the cornea is liable; I have given a brief outline of their several distinguishing characteristics, and I have endeavoured to convey to my readers concise ideas of the plan of treatment which I adopt in each instance, and which I have found to be most successful in practice. My views, in some of what I have expressed, may differ from those of others: I have only to say that I do not put them forward with any view of depreciating the opinions of authors, or in any spirit of controversy, but merely to add the result of my own experience to what has already been recorded on the subject; and in doing so I trust that I have stated my opinions candidly, but without any assumption or attempt at dictation; and as I hold it is the duty of every one in the profession to add, if it be only his mite, to the stores of knowledge, I occasionally take the liberty of throwing in some humble contributions, always feeling satisfied that they will be received, at least, in a tolerant and kindly spirit by my brethren, to whom they are addressed. —*Dublin Quarterly Journal, August*, 1856, *p.* 53.

84.—EPIDEMIC OPHTHALMIA OF THE IRISH WORKHOUSES.

By Dr. Frederick Kirkpatrick.

[This is a disease which during the last few years, in many places, has been very extensive, very troublesome, and very destructive. The treatment which has been found most successful is here given:—]

The first and most important step in treatment is the removal of the patient from the crowded dormitory into a healthy hospital ward. He is at once placed in bed, and if the case is in the first stage, an attempt is made to cut the disease short by dropping into the eye a collyrium, consisting of one part of liquor plumbi subacetatis, one part of vinum opii, and two parts of distilled water. This drop is repeated every hour, and in a large proportion of cases the disease is checked, and gets well without the use of any other treatment whatever, either local or constitutional. A solution of nitrate of silver, four grains to the ounce, may be used in the same manner, but after repeated comparative trials of both applications, my decided preference has been given to the former.

If the patient does not come under notice until the eye is closed by the swollen upper lid, the drops are never used, as it has been found that in this stage they fail to arrest its progress, and often act injuriously by adding to inflammation. Leeches are at once applied at a little distance from the outer angle of the inflamed lid, and their application repeated at short intervals.

The frequent application of a small number succeeds better than one large leeching, which weakens the patient, and fails to cut short disease. In addition, the lower lid is everted, and its villous surface lightly scarified. The incisions generally bleed freely, and the inflamed membrane, on the instant, becomes of a paler colour. This plan of depletion is repeated daily and, in many instances supersedes the necessity of frequent leeching.

General bleeding is never practised; neither is cupping resorted to.

The bowels are freely opened with a solution of sulphate of magnesia, with a little dilute sulphuric acid; and after the acute stage has passed over, the same mixture is given, with the addition of quina and sulphate of iron.

When the chemosis is very turgid and tense, it is carefully incised with a sharp eye knife, or lancet, and if an ulcer is observed at the margin of the cornea, the incision is made opposite that point.

For some time past I have abandoned the operation of snipping out a portion of the chemosis, which has been recommended by some writers, as I found it to increase inflammation, and to accelerate the progress of the corneal ulceration. All through, the greatest attention is paid to the removal of the irritating matter from the eyes, this is done by gently injecting over them tepid water, or poppy decoction, from a gum-elastic syringe.

The eyes are cleared of the adhering discharge with small pieces of old linen, which are thrown away immediately. Sponges are never allowed; but worn-out sheeting is torn up into small pieces, and several bits left daily on the head of each bed. Owing, as I believe, to these precautions, the complaint, which is generally admitted to be highly contagious, has never extended to the other children in hospital, or to any of the attendants. In the first days of the attack, a sufficiency of light nourishing food is allowed, and when the acute stage is passed, full diet is given, with porter, tonics, and in some cases cod-liver oil.

Mercury is never prescribed in any form during the acute stage; and I am strongly of opinion, notwithstanding the high authorities that have recommended it, that it should be entirely excluded from the treatment. The deep-seated pain through the eyeball and brow denotes that inflammation has extended to the structure of the cornea, and that ulceration has taken place; but the inflammation is not of the adhesive kind that calls for the action of mercury. I must, therefore, enter an earnest process against its use, as I believe that it is eminently calculated to increase the activity of the ulcerative process, and so hasten the penetration of the cornea, and consequent loss of the eye. After the inflammatory stage has, for some time, passed over, it is, however, prescribed with much advantage in the form of the bichloride for the removal of the deposits and corneal opacities which are so frequently observed to remain.

As soon as the vascular tension has, in some degree, subsided, the

eyes are frequently syringed with a weak solution of alum, which, after a few trials, is increased in strength, and finally used in the saturated form. The nitrate of silver in the proportion of four grains to the ounce, is also used with advantage; but I prefer its application to the lining membrane of the everted lid, in preference to having it dropped into the eye.

In this stage the upper lid is daily everted, and its congested surface lightly scarified, the flow of a very few drops of blood being sufficient to cause marked paleness of the villous surface. When the granular condition of the membrane still persists, its surface is brushed over with a solution composed of sulphate of copper, sulphate of zinc, and sulphate of alum: three grains of each of the first two salts, with six of the latter, to the ounce of distilled water. A drop of a solution composed of five grains of sulphate of zinc, two drachms of wine of opium, and one ounce of water, is always used with advantage at this stage.

Escharotics in substance are never used, as I believe that they injure the delicate structure of the conjunctival membrane, and lead to the establishment of the hard, incurable form of granulation. The application of the acetate of lead in powder is also avoided, for the same reason.

As soon as possible the patients are allowed into the open air, and are not permitted to return to the crowded dormitory, or to the confinement of the school-room, until all trace of disease has disappeared from the conjunctival membrane.—*Dublin Quarterly Journal, May*, 1856, *p.* 346.

85.—IMPROVED METHOD OF OPERATING FOR STRABISMUS.

By C. Holthouse, Esq., Surgeon to the Western Dispensary for Diseases of the Eye.

[The operation, when performed in the usual way, leaves a distinct cicatrix in the conjunctiva, which becomes adherent to the sclerotic coat. Another drawback is a return of the inversion in two or three weeks. This is sometimes caused by the contraction ensuing on the cicatrization of a large conjunctival wound. These objections with many others may be entirely avoided if the operation be done sub-conjunctivally.]

This sub-conjunctival mode of dividing the faulty muscle in strabismus, which is merely an extension of the principle of the subcutaneous section of tendons in club-foot, was, I believe, first recommended and practised by M. Guérin, in France. In 1843, my friend and colleague, Mr. Charles Brooke, wrote a paper on the subject, in which the defects inseparable from the ordinary method of operating were pourtrayed, and the sub-conjunctival section proposed as a remedy; but his little

essay does not appear to have received the attention it deserved. From that time till the publication of my lectures, two years ago, the operation had been scarcely noticed by any English writers except for the purpose of condemnation. In that work I ventured for the first time to draw the attention of the profession to its merits, and pointed out its advantages in the following words :—

"In the first place, the small puncture made by the scissors is entirely covered by the lower eyelid, so that not only is there no breach of continuity visible in the conjunctiva, but all air is excluded from the wound, and thus the accession of inflammation is prevented. Secondly, the relations of the conjunctiva to the eyeball and the eyelids being undisturbed by the operation, the symmetry of the two eyes is preserved, and the plica semilunaris and caruncle maintain their normal position. Lastly, it is followed by less protrusion of the eye than results from the ordinary method of dividing the muscle."

The above advantages are so obvious and decided, that I was not surprised, on my return from the East, to find that Mr. Critchett had also come forward as the champion of this principle, and that his method of performing the operation, as set forth in 'The Lancet' of May 19th 1855, had been adopted by some of his colleagues at the Royal Ophthalmic Hospital, Moorfields. It is not my intention to criticize either his or other operations that have been undertaken subconjunctively; I will merely observe that, having seen them performed by their respective inventors, and having practised them myself with their own instruments, I consider them inferior both in simplicity and effectiveness, to that which it is the object of this paper to recommend. The operation, we will suppose for convergent strabismus, is thus performed :—The eyelids being held apart by the spring speculum, and the eye drawn from its unnatural position, a small incision must be made with a probe-pointed pair of scissors, through the conjunctiva and ocular fascia down to the sclerotic; this should be made three or four lines internal to the cornea, a little above or below a line horizontal with its upper or lower border, according as it is elected to divide the muscle from above or from below. Into the aperture made by the scissors, the knife represented in the annexed woodcut is introduced, and passed underneath the muscle; its back must then be turned to the sclerotic, and its sharp edge towards the tendon of the rectus, which quickly yields to the slightest sawing movement of the knife, and generally with a very audible crack; the instrument must now be withdrawn through the same aperture at which it was entered, and the operation is completed.

The knife figured in the above engraving was designed by myself, after repeated trials of a variety of instruments on the dead subject. Neither M. Guérin's knife, which has a convex edge, nor Mr. Brooke's, which has a concave one, can be depended on for dividing completely the muscle only without the conjunctiva; nothing but a cutting edge perfectly straight will effect this. The angle which the blade of the knife forms with its handle facilitates its introduction beneath the muscle, and approximates it to the form, as, indeed, it subserves the purposes, of the blunt hook, while its blunted extremity protects the sclerotic from injury, and thus does away with the necessity for a director. As a further protection to the sclerotic, I have lately had this knife slightly beaked at its extremity.—*Lancet, Aug.* 2, 1856, *p.* 130.

86.—THE CONDITION OF VISION THE BEST TEST OF THE SQUINTING EYE.

By C. Holthouse, Esq.

[Among the numerous writers on strabismus, there is a great difference of opinion as to the best and most certain test for discovering the faulty eye. Walton observes, that when there is any doubt, "I place the patient two or three yards in front of me, and direct him to cover the left eye, and look at me with the other, keeping the head straight: the right eye will be in the centre of the orbit; I then have the left eye uncovered. Now if the sight be normal, it will keep its central position, while the left eye is turned inwards, but if it be deformed it will turn in, while the left will become straight." Mackenzie follows Lucas's rule: he says, "If we close both eyes, and then suddenly raise the upper lids, the pupil of the worst eye is discovered to be more distorted than that of the better eye; if either of them, on being opened suddenly, showed no obliquity, we would pronounce that eye to be sound." Dixon observes, that the best rule is "to watch attentively which eye squints most when the patient uses them in his ordinary way, and to operate on that in which the distortion predominates." Mr. Holthouse says]

In my lectures on strabismus, published two years ago, I pointed out the law which determines the alternation of the squint; and since then I have had abundant opportunities of testing its value, as well as proving the inutility of all other tests. This law may be thus expressed:—The less the difference in the visual power of the two eyes, the greater the tendency of the squint to alternate; and conversely, the greater the difference in the visual power of each eye, the less the tendency to shift.

The visual power, then, is the only test that can be depended on, and the rule of practice would appear to be this:—In true alternating squint, where the power of the two eyes is alike, it is immaterial which eye is operated on; while in the false, and by far the most fre-

quent, variety of alternating squint, that eye should be selected for operation the visual power of which is inferior.

Shortly before my return from the East, I was requested by Dr. McCraith, of Smyrna, to operate on a young Greek lady, who squinted very decidedly, though with which eye it was difficult to determine, as it continually shifted from one to the other; it seemed, however, to have a preference for the left. Walton's test failed completely; but vision was most perfect in the left; that is, in the eye apparently most affected; it was not bad in either, the patient being able to read with both, though a smaller type with the left than with the right. Notwithstanding the right eye seemed to be the straight one, I operated on it rather than on the other, owing to its less perfect vision. The correctness of the diagnosis was at once made manifest by the extraordinary size and toughness of the tendon of the internal rectus, as well as by the rectification of the deformity in the other eye. The preference (if I may so use the term) of a squint for the better eye is a curious phenomenon that was noticed many years ago by Dr. Radcliff Hall, and is occasionally due to certain extraneous and sometimes appreciable causes. A little boy, ten years of age, was brought to the public Dispensary for a stye on the outer part of the left upper lid; the eye on the same side was also considerably inverted. At first sight I considered that this was a case of single convergent strabismus of the left eye; but on placing a book before it, I found its vision quite perfect; while, on placing it opposite the other, or straight eye, he could with difficulty decipher the letters. This fact at once assured me that the latter was really the strabismic organ, and that the inversion of the opposite one was only temporary. In the course of a few days, the stye had disappeared; and, as I anticipated, the squint had disappeared with it, and had been transferred to the opposite eye. I think there can be little doubt that the inflammatory condition of the eyelid in this case determined the strabismus to the good eye; for the movement of the lids, being in great measure regulated by that of the eye-ball, the quiescent condition of the latter in the inner canthus would entail a corresponding condition of the former, and thus the pain arising from their movements be avoided. The bad eye was thus instinctively called into requisition, so that a superficial observer would readily have mistaken it for the good one.—*Med. Times and Gazette, June* 28, 1856, *p.* 643.

87.—*Erectile Tumour of the Ear cured by the external Application of the Perchloride of Iron.* By M. Leclerc.—[From the following case we learn that the external application of a solution of the perchloride of iron exercises a coagulating power on the blood, even when applied on the surface of an erectile tumour.]

The tumour involved the greater portion of the external ear, and was rapidly increasing; pledgets of charpie dipped in a solution of the

perchloride were applied to the surface, and maintained with a bandage. The fluid was thus brought in contact with the irregularities of the surface; the application was changed three times a-day, and was persevered in for two months. First the tumour ceased to enlarge, then it gradually diminished in size, and when the child cried the tumour no longer swelled out. A cure was obtained at the end of two months; the skin remained of a dark brown colour.—*Gazette Medicale.—Dublin Hospital Gazette, June* 1, 1856, *p.* 141.

DISEASES OF THE SKIN.

88.—CURE OF ITCH IN HALF AN HOUR BY SULPHUR IN THE LIQUID FORM.

By Dr. Edward Smith.

[Dr. E. Smith here draws attention to an article by Dr. Bourguignon in confirmation of the value of sulphur, combined with lime, in a liquid form, in the treatment of itch.]

The remedy is prepared by boiling one part of quick-lime with two parts of sublimed sulphur, in ten parts of water, until the two former are perfectly united. During the boiling it must be constantly stirred with a piece of wood, and, when the sulphur and lime have combined, the fluid is to be decanted and kept in a well stoppered bottle. A pint of the liquid is sufficient for the cure of several cases. It is sufficient to wash the body well with warm water, and then to rub the liquid into the skin for half an hour. As the fluid evaporates, a layer of sulphur is left upon the skin. During the half hour the acarus is killed, and the patient is cured, It is only needful then to wash the body well, and to use clean clothes. In Belgium the treatment is introduced by first rubbing the body for half an hour with black soap; but this does not appear to be necessary. The only essential act is that of the careful application of the fluid sulphur. The lime is of no importance in the treatment, except to render the sulphur soluble, and such would probably be the case if potass or soda were employed. The chief point in the plan thus employed, which is an improvement upon the mode of application of sulphur in substance with lard, is the more ready absorption of the remedy, and consequently the more certain and quick destruction of the insect, by using sulphur in a fluid form. In so disgusting a disease, it must be of great moment to be able to cure it in half an hour.—*Association Med, Journal, March* 8, 1856, *p.* 195.

89.—*Treatment of Scabies by Sulphuret of Calcium.* By W. B. Kesteven, Esq.—This treatment has been completely successful in every case in which I have tried it. I have not kept an exact record,

but should state the number at between thirty and forty. At the parochial institution in which I have had opportunities of putting it in operation, the greatest satisfaction is expressed at getting rid of the old filthy proceeding of inunction with sulphur ointment, and the saturation of blankets, &c., with the greasy mess.

Directly the slightest appearance of scabies manifests itself, I have the part well washed with the solution of sulphur for half an hour, and then left to dry. This proceeding is repeated on the following morning; and at night, or next morning, ablution with soft soap is performed. It is very rarely that a third application is required; in most cases, the second is unnecessary, but I enforce it in order to make security doubly sure. When the washing has been thoroughly and effectually performed, the apex of each vesicle appears of an opaque yellowish white colour, indicating that the sulphur has penetrated to its contents, and has destroyed the acarus.

So speedy, cleanly, and effectual a method of curing so loathsome a disease, is an immense boon, and cannot be too widely made known. By its means an offensive and often tedious plan of treatment is often superseded.

The cases with which I have had to deal, it should be stated, have been nearly all recent; but I am informed by my friend Dr. Fuller, of St, George's Hospital, that he has succeeded by the same plan in curing a case that had long resisted ordinary modes of cure.—*Association Med. Journal, June* 28, 1856, *p.* 549.

90.—*Observations on Anthrax.*—A case of anthrax of unusual size at the back of the neck, fully as round as the top of a hat, gave Mr. Lloyd, at St. Bartholomew's, an occasion this month to make some useful observations to his class on this disease. It is sometimes suggestive, perhaps, to jump, as it were, over thirty or forty years of hospital experience, and find what the differences of practice may be, and what the surgical legends or fashions about the beginning of the present century, and what they are at the present time. Mr. Lloyd, who acted a long series of years with the late Mr. Abernethy, stated that anthrax and boils were almost unknown in Mr. Abernethy's time, but that, of late years, from the importation of much bad corn into England, he is inclined to believe, and perhaps from meteorological causes, anthrax has assumed almost the character of an epidemic. Like Mr. Syme, he thinks anthrax, or carbuncle, to be a circumscribed inflammatory condition of the true skin, attended with considerable constitutional derangement, as well known to most practitioners; Mr. Lloyd disapproves of the stimulating plan of treatment, and prefers salines, with Mindererus, to diminish fever, with large free crucial incision made early in the inflamed part.

The object of the incision is to diminish the inflammatory action,

which he believes is of a low specific kind, and that by plugging the parts subsequently with lint, this carbuncular inflammation gives way to common healthy inflammation and granulation. He does not advise the external use of either caustic or what are called warm digestive ointments; they are very old fashioned, and merely protract unnecessarily the period of recovery, and destroy more of the skin than is expedient. In cases of anthrax, as well as in large boils, the the evil is aggravated, Mr. Lloyd believes, by giving patients too much food of a stimulating kind. The core of an anthrax, or boil, is perhaps not so often dead cellular matter, as a new morbid deposit, like the morbid deposit in the pleura, or in or around joints, and pointing to an inflammatory action going on in the system. Simple milk diet, poultices, salines, and diaphoretics, with free crucial incisions, answer every purpose, with the subsequent exhibition of a light bitter, with iodide of potassium, during the period of convalescence.—*Association Med. Journal, March* 29, 1856, *p.* 248.

91.—*On Urticaria.* By Professor Budd.—Nettle-rash may be produced in various ways; but its most frequent cause, and that which especially concerns us at present, is the imperfect digestion of particular articles of food. Amongst the substances that have been observed to bring it on, are shell-fish, especially crabs and muscles, pork-pie, fish, when tainted or out of season, honey, mushrooms, cucumbers, almonds, and oatmeal. The symptoms are too well known to require notice. The main object of treatment is to expel as soon as possible the offending matter. The stomach should first be emptied by an emetic of ipecacuanha or sulphate of zinc, and the bowels then cleared by a warm but quickly-acting purge. To allay the cutaneous irritation, Dr. Budd is in the habit of prescribing a lotion, made by mixing half a drachm of acetate of lead and half an ounce of tincture of opium with eight ounces of water.

In those cases in which the nettle-rash seems to be referable to several substances in common use, rather than to one special substance, it may sometimes be kept off by the administration (before dinner) of the rhubarb and ipecacuanha pill, or of a few grains of rhubarb, Dr. Budd gives a case which shows very satisfactorily the occasional efficacy of rhubarb in this disorder.

"It sometimes happens (says he), especially in women, that the nettle-rash, though depending immediately on the stomach, occurs only when digestion is weakened by over-fatigue, or by anxiety, or some other mental emotion, or by profuse monthly discharges, and that remedies of a different class are availing. In some such cases, when all the means I have before spoken of had failed, I have known the eruption disappear under the use of carbonate of ammonia, alone or in conjunction with tincture of gentian."—*British and Foreign Med. Rev., July* 1856, *p.* 46.

92.—*Skin Diseases.*—Dr. Hughes Bennett treats impetigo and eczema by assiduously keeping the parts moist with lint saturated with a solution of half a drachm of sub-carbonate of soda to one pint of water, covering this carefully with oil-silk, to prevent evaporation. Favus he treats with oil, so as to exclude the atmosphere.—*British and Foreign Med. Rev., July*, 1856, *p.* 245.

93.—ON POINTS OF IMPORTANCE CONNECTED WITH THE TREATMENT OF ULCERATED LEGS.

By Thomas Westlake, Esq.

[Few cases are so common and troublesome, as ulcers on the leg—they are met with at every turn of practice. The success and reputation of junior practitioners depends far more upon the proper treatment of them than upon the most intimate knowledge of those cases which are of comparative rare occurrence. Many points of practical interest rather than theoretical here noticed are well worthy of attention.]

Ulcers on the upper extremity, and other parts of the body, usually heal rapidly, while the cicatrization of those of the lower extremity is often attended with difficulty. This may be attributed to the weight of the superincumbent volume of blood weakening the vessels, and thus impeding the circulation. The getting rid of this trying difficulty I regard as the sheet-anchor in my mode of treatment—viz., *the complete and uniform support to the affected limb.* This is best maintained by a well-adjusted flannel bandage, from seven to eight yards long, and three inches wide. This plan enables the patient to pursue his ordinary avocation, at the same time that the wound is healed more rapidly and lastingly than by the most complete rest. In a work fraught with useful practical information, by Mr. Critchett, the preference in the treatment of ulcers is given to well-adjusted strips of plaster, Mr. Critchett considering that more equal pressure is thereby afforded than by any other process. I cannot concur in this opinion, being convinced that plastering is not so good as the support of the bandage. This practical surgeon thinks a bandage does not afford the same amount of equable pressure as plaster; but it is easy to show that this is not a valid objection, where the bandager is practically skilful. The bandage has, too, the advantage of perfect freedom from the disagreeable smell of plaster, which at night, and to a sensitive and irritable stomach, is not only objectionable, but almost unbearable. Again, the skin, particularly in varicose ulcers, is attenuated and irritable, and the application of plaster, however free from irritative ingredients, often produces a crop of eczematous or impetiginous ulcers, thus giving additional annoyance to the patient, and extra trouble to the surgeon. It may, too, be mentioned, that the new skin, being delicate and thin, is often torn away by the removal of the plaster.

It is admitted by Mr. Critchett, than when the plaster is clumsily applied, or with too much tightness, serious consequences ensue. The same objections can scarcely apply to bandaging, which can easily be loosened or removed by the patient. The practice and perseverance which Mr. Critchett states to be necessary to ensure sufficient dexterity in the application of the plaster, I grant, is equally true of the bandage; and I quite agree with Mr. Chapman, in his remarks, "that a single day's neglect at a critical juncture, or one day's unskilful application of the bandage, may undo all that has been gained by a month's care and attention."

It is by this valuable agent, compression, that Nature is most assisted in the reparation, and in ensuring a speedy and permanent cure.

The advantage of this support enables the patient also to use the important auxiliary of exercise, which exerts so beneficial an influence on the proper circulation of the blood; thus affording great relief to to pain, as well as improving the health and spirits, often much reduced, by having been subjected to the irksome panacea of a smothering in bed, and soaking the limb in poultices.

I am apprehensive that any description will fail to convey, even a faint idea, of the morbid appearance in the different classes and stages of ulcers. Experience alone can adequately convey it to the mind; nor will the success of treatment depend on a knowledge of the various characteristics, as described by authors; but upon the power of recognising each phase, and adapting the plan of treatment accordingly. "As right men in right places," so it is all-important to select the right time for the use of right remedies, which, however valuable in themselves, may, for want of proper discrimination, be thrown aside. and treated with unmerited neglect.

Is there any period at which a bandage cannot be applied? I believe not. Its superiority over fomentations and poultices is most marked. I have scarcely ever seen any *beneficial* effect from either poultices or fomentations; but I have often witnessed, as the result of their use, large flaccid granulations, and the temporary loss of all tonicity about the ulcer. I, therefore, jealously avoid even sponging the ulcer with warm water, but cleanse it with a piece of dry lint prior to dressing, which should be effected as quickly as possible, not allowing the ulcer to be exposed to the injurious effect of the air.

As regards the various remedies recommended by authors, I believe that experience alone can guide the surgeon in an advantageous selection; and while I would not advocate the merits of any one system of treatment to the exclusion of the others, yet, as a general principle, I affirm that water-dressing, either cold, warm, or medicated, has never proved beneficial under my hands, while the objections to it are many. If the lint or linen be allowed to become dry, the highly sensitive and tender granulations are irritated by the rough surface, and by its removal the new skin becomes often stripped. If the

wound be constantly saturated, it involves rest, neglect of business, and loss of the all-important remedy—support.

While the stimulating plan unquestionably possesses great powers, the experienced eye is necessary to regulate its employment. I have seen a healthy granulating surface, secreting laudable pus, completely destroyed by the injudicious application of even a *mild* caustic.

In indolent ulcers, particularly, it becomes necessary to vary the stimulants, or the ulcers become sluggish, and soon relapse into their former state. I have found the compound tincture of iodine the most safe and efficient stimulant; and in irritable ulcers, the application of the following lotion,—hydriodate of potassa, one scruple; hydrocyanic acid (Scheele), half a drachm; camphor mixture, one ounce,—applied for four or five minutes, with lint well saturated, acts as a charm. To be succeeded by the following ointment: spermaceti ointment, half an ounce; iodine, five grains; extract of belladonna, one drachm. I have seen little benefit result from the use of medicine, nor do I think it necessary for accelerating the healing process; the only requisites being a well-applied bandage, exercise, good air, generous living, and suitable appliances. I do not refer to ulcers of a specific character.—*Lancet*, *July* 12, 1856, *p.* 43.

94.—ON ECZEMA INFANTILE.

By Erasmus Wilson, Esq.,

(Read before the British Medical Association.)

[The great, the urgent symptom of this disease is the teasing, the intense itching, especially during the night; the child is often frantic with itching, it scratches with all its force, digging its little nails into the flesh, while the blood and ichor run down in streams.]

Not unfrequently in eczema infantile, the mucous membrane of the mouth and nose, of the air-tubes and lungs, and of the alimentary canal, participates in the disease, and is either affected simultaneously with the skin, or takes a vicarious part. The affection of the alimentary canal gives rise to diarrhœa, and the production of mucus in large quantities, and sometimes of coagulated lymph. The affection of the mucous membrane of the mouth and nose is shown by redness, sometimes aphthæ and augmented secretion; and the eczematous congestion of the mucous membrane of the air-tubes produces bronchitis in various degrees, accompanied with hoarseness from the thickening of the mucous lining of the larynx, and an excessive accumulation of phlegm throughout the lungs. This latter symptom is one which is calculated to give us some anxiety, and requires dexterous management; but it is less severe than common bronchitis, and is often as sudden in getting well, as in its attack. When the mucous membrane of the mouth and air passages is affected, hoarseness is a conspicuous and striking feature of the complaint, the hoarse cry is unmistake-

able, and is sometimes the first and only sign of the congestion of the mucous membrane. It is a sign as diagnostic of the congestion of the respiratory mucous membrane, as is whiteness of the eye of general anæmia.

In the treatment of eczema infantile, the three great principles which I have on every occasion advocated as the *law of treatment* of cutaneous disease, namely, *elimination*, *restoration of power*, and *alleviation of local distress*, are to be put in force, but with a change in their order. Elimination must always go first: in eczema infantile I would place alleviation of local distress, second; and restoration of power, third. The principle of treatment, the indication for treatment, being thus settled, let consider the means.

For *elimination*, the remedy is calomel or grey powder. I prefer the former. One grain of calomel rubbed down with one grain of white sugar, or sugar of milk, is the dose for the youngest infant; for a child a year old, a grain and a half; for a child two years old, two grains. Of course this dose is modified according to the apparent strength of the child in the first instance, and in accordance with the action of the medicine in the second; the object to be attained being such a dose as will produce an efficient relief to the alimentary canal, and, moreover, such an amount of relief as shall act as a diversion to the morbid secreting action taking place in the skin—in other words, as shall divert the morbid secretions of the skin into their more natural and proper channel, the alimentary canal. For this purpose, calomel excels every other medicine; and from its small bulk it is convenient for exhibition, merely requiring to be dropped into the child's mouth. It stimulates the liver to an increased flow of bile, and in children it always acts most kindly on the alimentary canal. Again, a free action of the alimentary canal being secured, all probability of *repulsion* of the eruption by the remedies required for the second indication is at an end, and the mother's and nurse's alarm lest the disease should be *driven in* are set at rest. A free clearance of the stomach and bowels is therefore a primary, a necessary step, at the very commencement of the treatment. After the first dose, the calomel may be repeated according to circumstances; once a-week, twice a-week, every other night for a few times, even every night for two or three nights if it be absolutely necessary. In my own practice, I usually find once a-week sufficient; and I am guided to the repetition of the dose by the state of the little patient. If there be any feverishness, fractiousness, irritability of temper, any increase of pruritus, inaction of the bowels, morbid secretion of the bowels, or threatened congestion of the mucous membrane of the air-tubes, then the calomel powder is to be administered at once without hesitation and without delay. The mother or nurse soon learns the moment for a powder, and whatever prejudices they may have to the *name* of calomel, they are always ready to resort to it after they have once seen its action in this disease. As I have already said, I have no

objection to the mercury with chalk, beyond the fact of its being more bulky and less agreeable to swallow, while it certainly possesses no recommendation which can render it superior to calomel. Sometimes I find one or two grains of nitrate of potash an useful addition to the calomel and sugar.

Having disposed of the first indication, and cleared out of the system any acrid matters that might be rebellious and capable of exciting irritation and feverishness, having moreover unloaded the blood-vessels of their watery and solvent elements by the same remedy, we may now have recourse to our means of *alleviating the local distress*, in other words, of soothing and healing the eruption, subduing the pruritus, and arresting the morbid discharge. We can do all this by the benzoated oxyde of zinc ointment (for the formula for preparing this ointment, see the 'Pharmaceutical Journal,' No. 5, for November, 1854), rubbed down with spirits of wine, in the proportion of a drachm to the ounce. This ointment should be applied abundantly, and gently distributed upon the surface, until every part of the eruption has a complete coating. The ointment should be applied morning and night, and if accidentally rubbed off, or used upon parts exposed to the air and friction, it may be repeated more frequently. When once applied, the ointment should be considered as a permanent dressing to the inflamed skin, and never removed until the skin is healed, unless special conditions arise which render such a process necessary. To ensure undisturbed possession to the ointment, a piece of linen rag should be laid over it and maintained in position in any convenient manner. Thus, when the eruption covers more or less of the entire body, I have a little shirt made of old linen, with sleeves for the arms and legs, and with means of being fastened closely around the legs, and, if necessary, closed over the hands and feet. This little dress is to be worn constantly, night and day, and for a week together, if necessary. It is intended as a mere envelope or dressing to the inflamed and irritated skin; and its saturation with ointment, which necessarily ensues, only contributes to its greater utility in that capacity. Where the eruption is chiefly confined to the arms or legs, linen sleeves will be sufficient for the purpose. On the face, no other covering than the ointment is necessary, but the latter should therefore be used the more largely.

Where the oxyde of zinc ointment is employed in the manner now described, the formation of crusts on the eruption is prevented, in consequence of the exclusion of the atmosphere and the consequent absence of desiccation. And when crusts are already formed, the object to be attained is to soften the crusts by saturating them thoroughly with the ointment, and then by gentle friction to displace them and substitute a thin stratum of the ointment in their place. When the eruption passes from the acute into the chronic state, and the process of exfoliation of the cuticle is active, gentle friction of the skin with the ointment is even more desirable than in the acute stage

of the disease, and, at the same time, very grateful to the little patient. On the scalp, the ointment should be applied in the direction of the hair to avoid matting; and as soon as the oozing of ichorous discharge has somewhat subsided, the hair should be gently brushed. I am rigorous in enforcing the non-disturbance of the ointment; but sometimes my *aides* carry their instructions beyond the proper point, and accumulate the ointment too thickly over a given part, retaining thereby the secretions, and interfering with the cure. In this case, if the finger be pressed upon such an accumulated plate of the ointment, the morbid fluids will be seen to ooze up between its chinks or around its edges, and the source of evil is detected. When such an occurrence takes place, the whole of the ointment should be carefully washed off the part with the yolk of egg, and after drying the skin, fresh ointment should be applied. This excessive accumulation of the ointment takes place the most frequently on the scalp, and is encouraged by the matting of the hair: a reason for keeping the hair brushed whenever the nature of the eruption permits.

Another of my instructions is to avoid washing the inflamed skin; it may be wiped with a soft napkin to remove exudations or secretions; but washing is unnecessary, indeed injurious, as tending to irritate the skin, and to increase the pruritus and inflammation afterwards. While the washing lasts and the irritated skin is softened by the water, the part is relieved and comforted, but the drying which follows more than avenges the temporary solace of the ablution. On the same principle, I never order or recommend lotions in this eruption.

In cases of *chronic eczema infantile*, that is, pityriasis capitis and psoriasis partium aliarum, the stimulant properties of the nitric oxyde and nitrate of mercury ointments may be brought into operation. The former is specific for pityriasis capitis, in the proportion of one part to three of lard; and the latter, variously diluted, from one part in eight, to equal parts, may be used for the chronic eczema or psoriasis of other parts, particularly of the eyelids. But even in the chronic state of the disease, the benzoated zinc ointment will be found to be an invaluable and indispensable remedy. In the parched state of the skin left by the chronic disease, glycerine may be found of use, as an emollient; but when any inflammation exists, it generally proves irritant, as compared with the zinc ointment.

We now come to the remaining indication in the treatment of eczema infantile, namely *restoration of power;* in other words, to correct mal-assimilation and restore the blood to its normal and healthy condition. For this purpose, the great remedy is that admirable alterative tonic, *arsenic*. It is remarkable how well infants of the earliest age bear this medicine, and how rapidly in them it exerts its tonic and assimilative effects. As an effective harmless tonic, arsenic stands alone and without its peer in this vexatious disease. Indeed, in eczema infantile it is specific; it cures rapidly, perfectly, unfailingly. It would

be difficult to say as much for any other medicine in relation to any other disease; and I pronounce this eulogium on arsenic after a large experience. The preparation of arsenic which I select is Fowler's solution, the dose two minims to an infant from a month to a year old, repeated three times in the day with, or directly after meals; and as malassimilation is always attended with anæmia in a greater or less degree, I conjoin with the two minims of Fowler's solution fifteen of vinum ferri, my formula being as follows :—

℞. Vini ferri, syrupi tolutani, āā ℥ss; liquoris potassæ arsenitis ℥xxxij; aquæ anethi ℥j. M. Fiat mistura.

The dose of this medicine is one drachm, with or directly after meals, three times a day.

With these three remedies, namely, the calomel powder, the benzoated oxide of zinc ointment, and the ferro-arsenical mixture, representing as they do the three indications for treatment of eczema infantile, I regard the cure as certain and rapid, and failure impossible; and if success were not complete, I should seek for the cause, not in the remedies, but in the mode of administering them. So confident am I of success, that I have often undertaken the treatment of this disease, without seeing the patient, and at hundreds of miles distance; being satisfied for my only *aide*, with the vigilance of an intelligent mother or nurse. I have never known any evil effects, present or future, result from this treatment; but I never fail to give strict injunctions that *if the medicine appear to disagree with the child it should be given less frequently*, say twice instead of three times a day, or *suspended instantly* if the child appear ill; moreover, that, in the event of such an occurrence, the calomel powder should be immediately resorted to. The period of continuance of the remedies must be left to the judgment of the medical man; the treatment sometimes occupies three weeks and sometimes more; and if a recurrence of the eruption should take place, the treatment should be recommenced, and conducted on the same principle and with the like precautions.

The *diet* of the child, while under this treatment, must be carefully inquired into; it should be good, wholesome, and nutritious. The leading constitutional indication is to nourish properly, and this idea should be carried out in the food as well as in the medicine. I find the juice of meat of great value in these cases, and it may be given either alone, as beef or mutton tea, or mixed with the other food.

The consideration of diet and food brings me to an important dietetic medicine, which is of great value in this disease, when the latter is attended with emaciation, and in the chronic stage; in acute cases it is less applicable. I mean the *cod-liver oil*. The child will often take the oil greedily in its natural state, and its good effects on nutrition are speedily made apparent: it may be given with safety to the youngest infant. In children somewhat older, and particularly in chronic cases, the cod-liver oil chocolate becomes an useful ingredient of diet.

When I have wished to avail myself of the excellent properties of

the cod-liver oil in conjunction with arsenic, I have often found the following formula a convenient vehicle for its use:—

℞. Olei jecoris aselli ℥ij ; vitelli ovi j ; liquoris potassæ arsenitis ℳlxiv ; syrupi simplicis ℥ij ; aquæ fontanæ q. s. ad ℥iv. M. Fiat mistura.

The dose is a drachm three times a day, with or directly after meals.

Where eczema infantile is complicated with diarrhœa, or congestion of the mucous membrane of the air tubes or lungs, the arsenical remedy should be instantly suspended ; the calomel powder immediately administered, and the ordinary antiphlogistic remedies adopted, magnesia and aromatic confection for diarrhœa, and ipecacuanha for the bronchitic or pulmonary congestion. Where the air-tubes are loaded with phlegm, an emetic is useful ; and a poultice to the chest and abdomen will be found an useful adjuvant.—*Association Med. Journal, Sept.* 13, 1856, *p.* 781.

95.—ON THE PATHOLOGY AND TREATMENT OF ULCERS OF THE LEG.

By John Kent Spender, Esq., Bath.

[Ulcers are often found on the legs quite independent of any varicose condition of the limb. We sometimes see them very troublesome in old people, or when the legs are subject to œdematous swellings. The principles of treatment must be such as will assist nature in her efforts. What method then does nature adopt? We know that in healing by the second intention, a portion of the exuded fibrine becomes metamorphosed into granulations, while the remainder is changed into pus, which forms a protective covering to it. The principle then will be simple and obvious, we have only to follow where nature leads the way, and interpret her teachings, and a successful result is almost infallibly attained.]

The indication plainly is to preserve and maintain the purulent secretion, which is furnished as a "protective covering" during the healing of the ulcer. In order to effect this, my father has proposed the use of an application which will form a chemical union with the secretion, and thus provide an incrusted layer over the granulations until they cicatrise. Such an application ought to be a compound of animal and mineral constituents; and when thus prepared, it fulfils the chemical and physical conditions required of it. Experience has shown that an ointment containing a very large quantity of prepared chalk, forms the best artificial incrustation. "The earthy matter must be in a much greater proportion than enters into any ointment in the Pharmacopœia, consisting of about three pounds of chalk to two pounds of lard. If about three ounces of olive oil be added, the ointment will not be too stiff, but will easily admit of being spread

upon linen. The best method of preparing this application is not by rubbing the chalk down with the lard; but, having previously reduced the chalk to a very fine powder, heat the lard to a tolerable temperature, and, whilst it continues hot, gradually add the levigated chalk in the same vessel in which the lard was warmed. By this means, it forms more of a solution than a mere addition; and the two ingredients thus become more intimately blended together. This should be stirred until it is nearly cold, and then placed by for use." A much more homogeneous compound is thus obtained than could possibly be procured by simple admixture or trituration.

Several capital advantages accrue from the use of this ointment.

1. It very rarely produces pain, and generally much ease and comfort. The great predominance of alkali prevents the lard from becoming rancid, and so producing irritation.

2. When the lard becomes melted by the heat of the part, and absorbed by the bandage, the chalk is disengaged, and a portion of it combines with the secretion from the ulcer. This secretion, which is often extremely acrid, and excoriates the neighbouring skin, unites with some of the chalk, and is converted into a neutral innoxious compound.

3. This compound constitutes the incrustation which is formed, first on the surrounding skin, then on the margins, and lastly, upon the surface of the ulcer. This incrustation is necessarily produced in a very gradual manner. It is only when the secretion has considerably diminished in quantity that a layer is deposited on the centre of the ulcer, but the covering which is provided on the edges completely protects them from irritation.

4. Little disturbance of the applications is necessary. At first, the quantity of discharge may demand the frequent removal of the dressings, &c., but in a short time this will be wholly unneeded, and our object should be to maintain the mechanical integrity of the chalky incrustation. All fomentation of the ulcer is obviously highly prejudicial.

Up to this point, I have been dealing only with the effects of an evil, not with the evil itself. Another element of disease is present, requiring another element of treatment to meet it. Even supposing that an ulcer on the leg can be made to heal by topical medication alone, it cannot be said to be cured, as long as the predisposing cause is suffered to exist intact. The adoption of any method which will simultaneously help to rectify both abnormal conditions, must be the nearest possible approximation to a healthy state.

Dilatation of the veins, incapacity of their valves, œdema of the areolar tissue, and passive congestion of the capillaries, constitute an enumeration of lesions which almost declare their own remedy—*powerful and well-adjusted compression of the whole limb.*

The lesion of the veins is principally mechanical, and therefore admits of mechanical treatment. When their walls are brought into

closer apposition by means of external pressure, the segments of the valves are also approximated to one another, and, so far as they are not altered by disease, are restored to the performance of their functions. To the lymphatic vessels and blood-capillaries compression appears to act as a mechanical tonic, bringing them back to their normal physiological condition. Each of the morbid states enumerated above is more or less dependent upon the others; and, consequently, if they are all subjected at the same time to the same curative effort, there is the greater probability of perfect recovery being attained.

The good effects of pressure are also noticeable on the ulcer itself. The edges are flattened and brought together; granulations which are too prominent are brought to the level of the surrounding skin. The extent of the ulcer is lessened during healing, and hence the size of the subsequent cicatrix is diminished also. But the results of pressure are not mechanical only; vital changes are produced in the condition of the ulcer, by which the organisation of new material is rendered more satisfactory and sure. Less fibrin passes off in an aplastic shape, and more becomes available for the formation of granulations; while in point of time, no method produces its effects with such certainty and quickness.

But just because compression is a therapeutic agent which produces benefit principally by its influence upon the causes of the ulcer, so our chief guide to its use should consist in the presence or absence of varicose veins. Writers on systematic surgery usually offer directions on the use of pressure, which are derivable solely from the character of the ulcer itself; and warn us against such a treatment especially in cases where irritability and hyperæmia are the morbid characteristics. But the character of the ulcer ought to modify only the topical applications—and not the plan of cure which is designed to palliate or remove the cause of the lesion. Theory is here a safe guide; and it will be found in practice that when *any kind* of varicose ulcer is well shielded by a chalky incrustation, and the limb subjected to complete and well-adjusted pressure, improvement in both conditions almost simultaneously manifests itself, the one proceeding *pari passu* with the other.

"Ulcerated legs almost always allow a greater degree of pressure without uneasiness than can be borne by a sound and healthy limb. This fact probably arises from the following circumstances: nearly all ulcerated extremities are more or less swollen and enlarged, either partially or generally, from the presence of varicose veins, or adventitious deposits. Now when tight compression is applied to such a bulky limb, one quick effect which it produces is to reduce the size of the veins, and to excite the removal of some of the deposits; and by this means, the leg becoming less, the tightness is proportionally diminished. But if the bandage is placed with the same force on the healthy limb, it meets with nothing so yielding, or which is so readily taken away to

diminish its bulk, and there is, therefore, greater resistance, and corresponding greater uneasiness and reaction are experienced. The same principle explains the fact, that the more swollen and enlarged the leg is, the better it submits to powerful compression; but that, as the cure advances, and the limb becomes reduced to its natural size, it is more sensible to the remedy. Hence pressure does not lose its beneficial effects in our treatment, like other stimulants. There is a gradual increase of susceptibility to its impression, which is equivalent to an increase of power in the pressure. There is a self-adjusting balance between the disease and the remedy; so that just in proportion to the length of time the roller is employed, and would hence be liable to lose its effects, there is an alteration produced in the limb, which changes the relation between the two, by making the leg more sensible to the bandage, which is precisely the same as if the force of the pressure were increased in strength."

A brief recapitulation of the points to be observed in practice may be here desirable. In doing this, I shall mainly follow the plan laid down in my father's work. When we are called to a patient suffering from ulcered leg, we should first institute a careful examination of the limb, for the purpose of ascertaining whether the veins are varicose or not. In ordinary cases, the condition of the vessels may be easily detected by their enlargements on the foot or on the leg; but sometimes we meet with a diffused swelling of the limb, or sponge-like ulceration of the integuments, and the leg is so swollen as to render it difficult to determine the state of the veins. Here the history of the case will materially assist us. The patient can inform us whether there had ever been soft purple prominences on any part of the limb; and we can ascertain by inspection whether the veins are enlarged above the knee on the same side, or on the foot and leg of the opposite extremity. The sex and age of the patient will also tell their own story—women being far more liable to varix than men, and old persons than young. But the practical indications of treatment are the same, even if the swelling of the leg cannot be demonstrated to proceed from varicose veins.

The next step is to examine the condition of the integuments in general, and the state of the ulcer in particular. The skin, for some distance around the ulcer, is often excoriated and inflamed, and is excessively vascular and painful. In the event of the existence of incomplete sloughing, or of active inflammation in the ulcer itself, the use of a poultice, or of some soothing foment, may be required for a short time, but for a *very short time only*. In all other cases, little attention need be paid to the superficial appearance of the ulcer, for it exercises hardly any influence in deciding the plan of management to be pursued. Such appearance, even if it be remarkably unhealthy, cannot be modified by poultices and lotions; but pressure is resorted to *at once*, by which the veins are supported, adventitious deposits are absorbed, the capillary circulation is re-established, and then the local

character of the ulcer is changed. In other words, a mechanical correction of the general cause is followed by a vital improvement in the local effect. All the directions for cleansing and purifying the ulcer, which occupy so prominent a place in the writings of the older surgeons, as well as in many of those of more recent date, may be at once superseded by the proper and immediate use of compression.

The first thing, then, is to cover the surface and sides of the ulcer, for some distance beyond the edges, with the chalk ointment, spread about the thickness of a wafer on thin linen. No compresses of any sort are to be placed upon this; they interfere with the regular operation of compression; they heat and overload the ulcerated part; and they prevent the escape of purulent secretion.

The second stage of the proceeding consists in the application of the bandage. A bandage frequently possesses advantages over strapping, by being less irritable to the skin; by being more quickly put on, and more quickly taken off; by being more easily removed without disturbing the surface or injuring the margins of the ulcer; and by more completely allowing the formation of the chalky incrustation. Equally superior is a bandage to a laced stocking, as the latter does not properly embrace the whole foot, nor can it be well fitted under the ankles. Placing a card, a piece of vellum, or beaten lead, between the limb and laced stocking, as advised by Wiseman, is also objectionable, from its being calculated to afford partial and unequal pressure. Then, with regard to the material of which the bandage is made, this may be either flannel or calico. The first possesses the advantage of being more yielding and elastic, and is, therefore, preferable in those cases where the greatest pressure is not required. In œdematous enlargements especially, the flannel appears the more suitable, as it is softer to the skin, and accommodates itself to the greater or less distension of the limb, arising from the augmentation and diminution of the fluid. The calorific properties of flannel are sometimes very useful, as in all structures and parts in which the capillary circulation is obstructed, the vital heat is reduced below the standard. Strong calico is the better material when very powerful and continued compression is demanded, as in most instances of indolent sores. The breadth of the bandage is an important point in practice. If the bandage be of flannel, the breadth should rarely exceed two inches; and if of calico, it should be still narrower. A roller of this width can be placed over the foot, around the ankle, and up the leg, without making the slightest wrinkle or irregularity, which cannot be done if it is broader. The length varies from four to eight yards, according to the age of the patient and bulk of the limb.

The bandage should be put on the limb in the ordinary way recommended in works on mechanical surgery, commencing at the metatarsal end of the toes, and carrying it completely up to the knee. With regard to the tightness with which the roller is applied, much more force may be used than is generally employed. Each turn may be

pulled as strongly as the arm allows: for the firmness with which the bandage is put on is not only for the purpose of gaining the good effects of compression on the structures underneath, but it also contributes very much to make it remain in its place when once applied. Patients usually bear the bandage exceedingly well, provided it be smoothly and evenly rolled around the whole limb.

The length of time which elapses before the bandage and ointment are removed and reapplied must, of course, be regulated by the circumstances of the case. When the ulcer is very extensive, and the discharge proportionally great, it will be necessary to dress the leg every day, perhaps, at the commencement of the treatment. But, generally speaking, ulcerated legs are disturbed much too often; and, as a general rule, all interference should be postponed as long as possible. One of the benefits belonging to the simple chalk ointment is, that by its unirritating properties, by its neutralising the acrid secretion, and by its protecting the neighbouring delicate skin, it permits the linen and bandage to remain on much longer than when nearly all other applications are resorted to. This is one of the capital advantages resulting from its employment, as it is obvious that the more seldom the dressings are disturbed, the less is the probability of the healing process being interrupted. Some local uneasiness is the best indication of the propriety of removing the dressings, in order to permit the escape of the discharge, which is always more frequently required in the early stages of the treatment.

The bandage being undone, the thin linen dressing is raised very gently, in order to allow as much of the chalk ointment to be left behind as may be attached to the surrounding parts and surface of the ulcer. In a very short time after the treatment of the case has been commenced, a thin film is formed about the margin of the ulcer; and if the ulcer be small, some of the incrustation may probably be observed on the surface. This must never be disturbed or taken off, for injury would thereby be done to the tender and sensitive granulations which are busy in filling up the cavity, or forming the cicatrix, and the protective covering of purulent fluid would be stripped away. At each succeeding dressing we shall commonly observe a gradual increase of the chalky incrustation; but it never forms an impervious coating, so as to prevent the escape of fluid, as might possibly be the case if a layer of powdered chalk in substance, or a thick watery solution of it, were employed,

The progress of healing in an extensive ulcer is frequently not confined to its edges, but sometimes small central spots pass onwards to recovery faster than the other portions of its surface. These, as they increase in size, tend to convert a large ulcer into a number of smaller ones: each central spot serves as a foundation for the commencement and attachment of the incrustation; and the chalky formations radiate from these as from so many points, until the circumference of one meets with the circumference of another.

When an ulcer is very extensive, and the healing slow and tedious, the successive deposition of chalky layers on the bordering skin occasionally forms so thick an incrustation as to require its removal; for otherwise it might prevent the ulcer itself from experiencing all the good effects of the use of the pressure. When the whole of the ulcerated surface is at length included by the incrustation, it should not be disturbed until a sufficient time has been allowed for the entire part to heal underneath. As soon as this is accomplished, the chalky crust becomes hardened, from the absence of moisture from the discharge; it then cracks, and separating into pieces, comes off by degrees itself. Its removal may be hastened by gentle manipulation, if we are quite sure that the ulcer is entirely obliterated.

In this account of the application of the method of cure, it will be seen that we are literally obeying and fulfilling nature's principles, and assisting her in carrying them into practice.

[General principles of treatment often require some modification in practice. The instances in which the plan of chalky incrustation and compression has answered most completely are superficial ulcerations, however extensive the surface may be, and whether dependent on varix or not. Deep and callous ulcers require a special treatment, which is best fulfilled by the addition of a stimulant to the chalk ointment, and the nitric oxide of mercury is the best. If this fail strapping and bandaging must be resorted to. The resin acts as a beneficial stimulus. In particular cases of superficial ulceration, in which irritability is the principal characteristic, we may suspect the existence of some form of toxæmia. Many remedies possess specific properties over certain dermal deseases, of these we may notice especially tar and iodine.]

Experimental combinations of the ointments of tar and chalk, and of those of iodine and chalk, are found to subdue many forms of irritable ulceration in the lower extremity which have altogether defied routine measures. Dr. Hughes Bennett and others confirm the immense utility of the external application of tar in all dermal affections of a psoriasical character; and the moist spongy ulceration which sometimes attacks the leg seems to possess a pathological affinity with psoriasis, as it is generally controllable by identical means. The mineral constituent of the ointment fulfils the mechanical condition of furnishing the incrustation, while the tar affords that specific element in the treatment which is required to meet the specific element in the disease. But the use of the bandage is of equal importance, as it affords support to the veins, approximates the dilated cells of the areolar tissue, and promotes the absorption of serum.

I have a case now under my care which illustrates the properties of the external use of iodine. Three ulcers, with indurated edges, were situated just below the knee: they had resisted every kind of treatment before the patient applied to me; and I found that they also

baffled my own ordinary methods. Careful inquiry elicited a remote history of syphilis. Acting upon this knowledge, I added a small proportion of compound iodine ointment to the ordinary chalk and mercurial ointment; and this, combined with firm pressure, produced a rapid and satisfactory cure.

The judicious use of constitutional remedies is of signal importance in all these cases. The secretions from the intestinal, renal, and cutaneous tracts of membrane, require to be encouraged and maintained; while appropriate hygienic measures contribute to the general good effect. Then it is very likely that the administration of the alkalies, or of iodide of potassium, or of small doses of opium, may seem to be called for by the special exigencies of the local disease, or of particular systemic derangements.

I have now described a method of treating ulcerated legs which has been followed with very great success. It is a method which was suggested by theory, but it is confirmed by constant practice; it imitates and assists the natural process, and accomplishes a cure usually in a certain and speedy manner. If it be philosophically right, then other opposite methods must be as surely philosophically wrong; and I believe that the infallible criterion of practice generally proves them to be so.

First, let me allude to that ubiquitous remedy, the *poultice*. This may be truly called the refuge of ignorance and of neglect. It is often prescribed without discrimination, and continued for the bad reason that we know not what better to do. For consider what a poultice is. It is a vehicle of heat and moisture—a combination of physical agencies calculated to dilate and to weaken the structures to which it is applied. It is exactly the contrary to a tonic, whether of a mechanical or of a vital kind; and therefore it is at utter variance with those principles which I have endeavoured to prove to be the foundation of the rational treatment of varicose ulcers of the legs. Incompleted sloughing is the only case in which an apology can be offered for the use of poultices; and even here I believe that a quicker result would be often attained by the bold and early use of compression. Under any other circumstances, a poultice can do scarcely anything but harm, and cannot be condemned in too emphatic terms. The character of an ulcer is materially deteriorated; healthy granulations become soft and bloodless; and the edges of the sore are rendered pale and unorganisable. Then the protective layer of purulent secretion is absorbed and taken away, and consequently the reparatory process is proportionately retarded. In few and decisive words, the application of a poultice is nothing less than a mischievous interference with the natural healing operations.

Lotions of every kind are quite as prejudicial. The constant application of cold water, however useful the substance may be of which it is the vehicle, is exceedingly injurious to a limb, the temperature of which is already reduced by the obstructions in the capillary and

venous circulations. Those progressive metamorphic actions in an ulcer which indicate that sound cicatrisation is being carried on, are arrested by the devitalising effects of cold, and a retrograde step takes place which sometimes approaches the condition of gangrene. It is frequently my lot to see cases exemplifying this fact; and it is almost equally often my lot to see them improve under the influence of the local stimuli of warmth and pressure.

When we are led to believe the uselessness of poultices and lotions by a study of principles, and are thoroughly convinced of it by observation in practice, we shall begin to reflect why we are wrong, and how we may become right. The surest plan for making any disease an opprobrium in medicine or in surgery is to forget or to ignore its cause, and consequently to err in the management and control of its obvious effect. Constant failure should lead us to suspect whether we may not have lost the clue to the correction of an abnormal state; and it is certain that we take more interest in any department of our art in which we have the steady light of a definite principle to guide us. Is it not so? Do not good intentions lose their practical force if not animated by sound knowledge? Complete discouragement gradually succeeds, and we alternately blame nature and blame ourselves.

To keep patients in bed is also an usual element in the prescription for the treatment of varicose ulcers of the leg. Here we see another offshoot of error, originating with the supposition that the disease owes its origin to a physiological, and not to a pathological, state. Compression answers every object to be gained by the assumption of the recumbent posture; and the help which this may theoretically be supposed to afford by no means counterbalances the acknowledged evils dependent upon the loss of constitutional exercise. Then we ought to remember that it is with many individuals a matter of most serious inconvenience to be compelled to abandon their pursuits and lie in bed. Their avocations are of such a nature, and of so much importance to their very subsistence, that they cannot afford to be idle. And this is also a matter of some moment in the economy of a hospital, where we frequently find beds occupied by cases of ulcer for an indefinite length of time, to the exclusion of other more urgent and more interesting forms of disease.

Exercise of the extremity without the use of pressure, must, of course, do harm; but whenever compression is resorted to, exercise confers the direct and positive benefit of assisting and sustaining those processes which are necessary for accomplishing the act of restoration. It has been well observed, that "rest of the limb admits of the healing of the ulcer by a degree of action which is unable to keep the part sound, and prevents this degree of action from being increased by the stimulus which exercise affords. But exercise sets up an additional energy in the process of reparation, both directly by the effects of it as a stimulus, and indirectly by the very obstacle

which it places before the healing function; for all living actions are strengthened by the opposition they have to encounter." It is in consequence of the healthy stimulus which exercise affords to the granulations, and the check which it imparts to their growth, that explains one of the reasons why ulcers get well so quickly and permanently while individuals are walking about. I have numerous facts in my possession which have practically determined this question, and authorise us to regard moderate use of the limb (with the single exceptional case in which active inflammation exists) as one of the rational elements of our treatment.

The effects of a pathological state may sometimes be anticipated by employing compression on many legs in which an ulcer has not yet appeared. If our science is so often at fault in the attempt to remove an evil, we ought to discover in this the stronger inducement to ward off its approach. The principle is alike in both cases. Whenever a limb is manifestly varicose and enlarged, even though the integuments be perfectly intact, we at once note the signal of coming danger, and apply our remedies accordingly. Equal vigilance is necessary that during the treatment of an actual ulcer, the compression is not too suddenly discontinued, or diminished in force at too early a stage.

An appropriate conclusion to this series of papers may consist in the enumeration of, and brief comment upon, the various measures which have been proposed for the treatment of the varicose ulcer of the leg.

These measures may be comprised under two classes—the medical and the surgical.

Of the latter, I shall first notice Mr. Syme's proposal for blistering the edges of the callous ulcer. The effects of the blister are principally dynamical, and are said to disperse the subcutaneous induration and thickening, and so to remove the obstacle opposed to healing action. The obvious objection to this method is, that it establishes another solution of integumental continuity in addition to that already in existence, and may therefore materially embarrass and hinder the intentions of cure. The cause of the original lesion remains untouched, and it would theoretically appear undesirable to attempt to remedy one evil by creating another.

Mr. Holt has proposed the exclusion of atmospheric air as an agent in the treatment of ulcers of the lower extremity. From a piece of adhesive plaster, somewhat larger than the sore, a portion, just the size of the latter, is cut out; the plaster is then applied to the part, and painted with collodion. Oiled silk is now placed over the ulcer, and made to adhere to the plaster by means of the collodion, by which process the air is completely excluded from the ulcerated surface. The whole is then secured by strips of adhesive plaster placed crosswise, and by a roller running from the toes to above the knee. Two cases are recorded in which perfect cicatrisation was effected. I

imagine that the benefit resulted almost solely from the judicious use of compression rather than from any specific good derivable from the exclusion of atmospheric air.

M. Denonvilliers has recently brought glycerine under the notice of the Paris Société de Chirurgie, speaking highly of it as a very clean application for ulcers. Glycerine has been compared with the oils, and has been supposed to act as an inert substance, protecting wounds as neutral fatty bodies do. It is, however, a body analogous to alcohol; and so far from being inert in its action on the organic tissues, it penetrates these more rapidly than water does, and exerts a special action on several of them.

The application of charcoal to ulcers of the leg has found an advocate in Dr. Neumann. Strips of adhesive plaster are applied above and below the sore, and across its middle, the intervals between the strips being strewed with charcoal covered with ointment, spread on lint, and bandaged; this dressing is renewed every two or three days. In this manner ulcers, which have continued open for years, have been healed in six or eight weeks, the patient still taking moderate exercise. Complete exclusion of atmospheric air is the principle aimed at by Dr. Neumann's plan.

Mr. Gay maintains that the obstacles to the entire and permanent healing of indolent ulcers are to be found directly in the condition either of their edges or of the adjoining tissues, or in that of both conjointly. In other words, the edge of the ulcer is not free to contract, or the adjoining textures are not free to yield to the traction that the edge, in closing in, makes upon them. Mr. Gay has, therefore, suggested that an incision be made through the healthy skin and superficial fascia, within a short distance of the edge of the ulcer, in a direction parallel to the axis of the limb, and, therefore, at right angles with the line of principal tension. I have never yet tried this operation, simply because I have never yet met with a patient who would submit to it. However sound in principle it may appear, yet there is the obvious risk that the artificial openings may become as reluctant to heal as the original lesion. Mr. Chapman has since commented on Mr. Gay's proposal, and adopts a modification of it which he considers simpler in performance, and attended with less danger; but he admits that the cases are extremely few in which an operation is indispensable; and still fewer, he thinks, are the private patients who will allow the treatment of an ulcer on the leg by the scalpel, even when all other attempts have failed.

To Mr. Hainworth is due the credit of criticising and reviving the ancient practice of excising the margin of the callous ulcer. The primary obstacle to successful treatment in this case is the presence of a solid ring of compact and indurated effete cuticle, which constricts the vessels of the cutis immediately around the ulcer, and consequently arrests the formation of new skin. Several methods of treatment have been directed to the exclusive object of removing this

ring, as a necessary introduction to other treatment; but Mr. Hainworth believes that the most safe, easy, and expeditious method is to perform its entire excision. The operation appears to date its origin Society's edition of the works of that author, and of Paulus Ægineta, at least as far back as the days of Hippocrates; and in the Sydenham Dr. Adams has shown that it was advised and practised by them, and by a long succession of great authorities, down to a comparatively recent period. In the non-varicose form of indolent ulcer, there can be no doubt of the signal value of the method here proposed.

The application of the electric moxa has been explained and illustrated by the late Dr. Golding Bird and by Mr. Spencer Wells. My experience of this remedy is very limited, but it has appeared to be a remedy of great efficacy in the indolent form of traumatic ulcer.

The internal administration of several specific remedies has been recommended—some apparently on empirical grounds—as the tincture cantharides and the oil of turpentine; but the use of opium is advocated by Mr. Skey upon principles which are unquestionably authentic and sound.—*Asso. Med. Jour., May 3 and June 7, 1856, pp.* 365, 480.

96.—ON THE DEFORMITIES OCCASIONED BY THE CICATRICES WHICH RESULT FROM BURNS.

By Francis Rynd, Esq., A.M., Surgeon to the Meath Hospital.

[There are but few cases which come before the operating surgeon with a deeper or more engrossing interest than the cicatrices which result from deep or extensive burns, and it is a fact which cannot be disputed that most of the operations which are performed for their relief are unsuccessful.]

I believe the peculiarity of the burn or scald to be, that it is attended with a degree of inflammation, greater or more intense than that which occurs in injuries of seemingly equal extent and violence; that is, that whatever the effect of inflammation may be on the ultimate structures, these effects are wrought out more extensively and completely in the burn than in any other accident. Thus, if inflammation is assumed to be a debility or weakness of the vital actions concerned in the nutrition of the part, we should be led to consider that in the inflammation of the burn or scald, that debility is exaggerated and increased, and this view of the subject appears to be substantially borne out by observation of the external symptoms. Thus, looking on the shock inflicted on the nervous system, the severity of the irritative fever, the intensity and persistence of the pain complained of, and the quantity of constitutional distress so disproportionate in general to the extent of local injury, we must acknowledge that these are something more than the ordinary concomitants of inflammation: and, subsequently, during the progress of the case, observing the slowness with which the sloughs are cast away, the size

and softness, and flabbiness of the granulations, the profuse abundance of the discharge, and its foul and fetid quality, the tediousness of cicatrization, and, altogether, the deficiency of vital energy so remarkable throughout the entire process,—it is impossible to avoid the conviction that in the burn there is something more than commonly unfavourable to recovery, something that indicates a more than ordinary depression of the living principle. But, besides this obvious debility, there seems to be an inequality in the severity of the inflammation, and in its effects. I mean not by this expression the difference that must exist between the part to which the heat has been applied in a concentrated form, or been long continued, and that which has been less exposed to its influence, for every one is acquainted with the variety thus caused, and that every form and degree of burn may be found in the one individual as the consequences of the same accident; but that, on the same surface, and apparently without any cause, there are spots or specks where the burn seems to have sunk more deeply, or at all events where its consequences are more severely experienced. This inequality of the inflammation will be hereafter found to exercise a very important influence over the progress and termination of the case.

The chief attention ought to be bestowed on a case at the very time when it is most usually withdrawn from it, and a patient most carefully looked after just when he is discharged from hospital, and probably lost sight of for a length of time, or for ever. It is true, that if the injury is situated on a fixed and immovable part—as on the outside of the thigh—there will be no very obvious deformity; and the inconvenience, whatever it may be, will be strictly limited to the part itself engaged: in this case, no interference with the progress of the case is called for, as none would have the least effect in altering or modifying the character of the cicatrix; but where it is placed on a movable part, and especially on one, the motions of which may be successfully antagonized or restrained, it is essential that position, splint, and bandage, nay, that mechanical contrivances of a more complex nature, and all and every surgical appliance that could be brought into play, should be not only resorted to, but rigidly persevered with, in order to preserve the part or the limb in its natural position, or, if that be impossible, in the one most nearly approaching to it. This treatment must be continued for a length of time, some say for a month or six weeks, but, according to my experience, a much longer period is necessary, and it is absurd to fix any specific time, for much will depend on the extent and depth of the injury, the health and constitution of the patient, and those numerous and often inappreciable circumstances which modify and determine the character and course of every sore. Perhaps the most reliable guide on such an occasion will be the cicatrix itself; for when it becomes pale, or loses its red tint, and acquires the colour it is permanently to hold—sunken below the level of the adjacent parts—perforated with small

apertures, as if it sent down small funnel-like processes into the deeper structures—and, more than all, when it becomes movable over the subjacent substance—it is evident that the diseased process has been completed, and that no further tendency to contraction exists. It is curious, that during all this time the chief opposition to our preservative efforts generally comes from the patient himself. It would appear, either that this secondary process of cicatrization (if it may be so called), is so irksome and painful, or that the efforts to restrain its effects, or both taken together, are so distressing as to become almost intolerable. I have known patients, although fully warned of the consequences, stealthily loosen their bandages and relax their dressings, to escape the discomfort occasioned by them, and when precautions were taken to prevent this, actually leave the hospital rather than submit to the requisite restraint.

But, unfortunately, it is possible that a burn may be situated in a position where it will be impracticable to apply any mechanical means of restraint, and where, of course, the prevention of some degree of deformity is unattainable. Where the motions of a part are necessarily very loose and free, and its muscles have only one permanently fixed attachment, as in those of the face generally, for example, it is clear that no mechanical appliance will be capable of restraining them, and that some degree of deformity is inevitable. Again, where the motions of a part, although, perhaps, susceptible of restraint, are nevertheless habitually so free and constant that the application of such restraint soon becomes intolerable—as, for instance, those of the head upon the neck—a successful management of the case is nearly of equal difficulty, and, accordingly, it is in these two situations, namely, on the face and neck, where disfigurement of any kind is most distressing, that it is most likely to occur, and most difficult to prevent. These are cases in which the surgeon will be almost certain to incur reproach, for patients are never willing to believe their own sufferings irremediable, and although the cause of failure may rest principally, if not entirely, in themselves, are quite willing to place the responsibility and the blame on any shoulders but their own. These also are the cases in which the resources of operative surgery are so frequently called on at a subsequent period with a view to the removal of the deformity, and in which they are generally so unsuccessful, that many practitioners decline them altogether, refusing to inflict such severe pain and such protracted confinement where the result is so extremely uncertain. I believe there are numerous cases in which a cure is perfectly impossible, where the adhesions formed by the new membrane are so numerous, so deep, and so extensive that they cannot be detached, and if they were so, where the same cause that originally produced them, still in operation, would cause them to be renewed. Situated generally on the face, where any deformity is so unendurable, they render the unhappy patient not only willing to undergo any operation, but pressing for its performance, and

thus, while they account for the frequency of these operations, explain their want of success. Many surgeons, guided by the results of their own observation, decline to operate on the cicatrices of burns at all; others have distinctly marked out and specified the parts of the body in which operation should not be attempted; and all seem unwilling to hazard their reputation on a proceeding from which so little has been gained hitherto.

I am not now about to delay in enumerating the various operations which have been devised and practised for the relief or removal of these deformities. I have seen a transverse incision through the cicatrix carried down almost to the bone, and the most forcible extension made afterwards, almost to the tearing of the parts asunder; yet, when the wound was subsequently healed, little or no benefit had been derived from the proceeding. The cicatrix has been divided by several transverse incisions in different parts of its extent, without any very successful issue being obtained. In other instances I have witnessed the attempt of wholly dissecting out the supposed morbid cicatrix—a proceeding tedious, painful, and bloody, and, it must be acknowledged with regret, generally ineffectual. In fact, almost all the operations that have come within my observation have been only partially, if at all, successful, principally because the operator's attention has been directed more to the cicatrix itself than the newly formed structure underneath, which is really the active agent in the production of the contraction, and the inconvenience consequent thereon.—*Dublin Quarterly Journal, August*, 1856, *p.* 84.

SYPHILITIC DISEASES.

97.—ON THE COMMON SORE OR VENEROLA, AND USE OF MERCURY IN SYPHILIS.

By F. C. Skey, Esq., Surgeon to St. Bartholomew's Hospital.

The common sore, the *venerola* of Evans (this term has been laughed at, and probably will be again and again; but it is just as good as any other), the venerola vulgaris, or common sore, is the product of sexual intercourse, a sore or pimple coming on about the third or fourth day, occurring on the glans, corona, prepuce, dorsum, meatus, or frænum; in fact, occurring anywhere, and, after a day or two, ending in a pustule with a scab, which breaks, but leaving no mark on the constitution in the shape of secondary symptoms. There are three stages through which we may in general trace this sore: the first is a stage of an ulcerative character; the pimple, so to call it, goes on increasing, as you see it every day in hospital, till it is the size of a pea, or even as large as a finger nail: the second stage is marked by this peculiarity, the sore throws up a border, or mound, or elevated edge; granulations form now also, even up to the edge of this

"mound;" we have a stage, in other words, of what we may call granulation: while, in the third stage, these granulations begin to be absorbed, followed by cicatrisation. Now, I would say, above all things, be prepared for this ulcerative or preliminary stage perfecting itself. You first see the pimple when it is very small, but it will be larger and larger; you cannot stop it. The patient, when you are called in, is frightened out of his life; he says, "Can't you stop it spreading?" "No, not for the world." You are sure to have the second and third stage, just as in a vaccine vesicle—the mound or elevated edge, followed by cicatrisation. But you have with this sore—and this is worth boat-loads of theory—no secondary symptoms, no mark in the constitution, or poison absorbed; so you may be perfectly at ease about the matter.

I have said that you will have granulations springing up: I would wish now to qualify that a little. Pressure, you are aware, interferes with granulating surfaces; the pressure of the prepuce, for instance, prevents the sore having exactly the same characteristics as when there is no pressure—on the dorsum, for instance; and, accordingly, the sore behind the prepuce is ragged. The most perfect form of the common sore or venerola is on the dorsum. Now, you must recollect this sore is the ulcer of gonorrhœa. If you try infection or inoculation of gonorrhœal matter, the person will have this sore. It is cured perhaps by the same means that gonorrhœa is cured; for you must know that gonorrhœa, if left alone, will wear itself out, as this sore will do also, in a few weeks, both having their perfect consummation and cure in a sort of spontaneous disappearance or exhaustive process, as singular as their first origin or increase. We have even some modifications in fact, of this sore. You no doubt have often observed in the female venereal patients, in those poor wretched creatures that come here every review day to be examined, gonorrhœa, sores, condylomata, in the same patient. What are condylomata? Merely the sores of venerola or gonorrhœa, with excess of granulations, from neglect. What do you do with condylomata? Anything or nothing. Dust them with some powder, or let them alone. They are in no measure, however, specific sores, or requiring mercury; they are the sores spoken of by Mr. Abernethy, with new flesh, or "proud flesh" some might call it; but they are merely common sores, which, as I have said, do not require mercury, and do not, nor ever did, produce secondary symptoms. Mind, now, that about these sores there is no thickening, tumefaction, induration; for these terms are all different. If you find an *old* venerola, you always discover it to have an elevated edge; that is the character of such sores: even old sores on the legs will have elevated edges. But if you use the word induration, it is a different matter altogether—a thing like cartilage, like the edge of this table. I will venture to say you will not find an indurated sore in the entire hospital at present; you will scarcely see it once in an entire season; so do not mind the old books.

Now, as to *bubo*. You may have bubo, of course, with common sore; and it is curious you have the bubo in common sore near the last stage, when the sore is healed. But, before we say anything about bubo, perhaps we must refer to the true syphilis bubo. If your patient happens to have true bubo, you feel a distinct gland enlarged under your finger: that is not the character of common bubo; it is rather a mound of inflamed tissue, like an abscess, running along the line of Poupart's ligament. There is no suppurative action in true bubo, but you have copious suppuration in common bubo. None of these common sore or venerola complications, however, are at all bettered by mercury. The ulcerative stage is stopped by mercury, but it goes on again from the point where it has been suspended. There is immense confusion, of course, when the sore is stopped, and goes on again, like a clock almost stopped, and going on again of its own accord, and yet expected to keep true time.

Now, as to *treatment*. What is the chief and abiding principle of treatment in *venerola?* To look on and keep the parts scrupulously clean. If you do right, you will not interfere at all with the first or ulcerative stage. Tell your patient the sore will take such or such a time to get well; meanwhile, if he wishes to try *lotio nigra*, or acetate of lead wash, you may humour his fancy; but you cannot stop this ulcerative stage; it will go on again from exactly the same point you stop at, whether you stop it by mercury or caustic. Above all things, instruct your patient to keep the parts clean, or he will have a "crop of sores." Simple spermaceti ointment or lint, or spermaceti and morphia or opium, I find about the nicest application. You should, moreover, give your patient, especially in the second stage of the sore, bark or quinine, and an extra allowance of good wine; these will accelerate the healing process more than all the mercury in the world. At the end of about four months, look out for secondary symptoms; but I think, though you should call such things from the "vasty deep" of the old books and schools, you will not find them; in fact, there are no secondary symptoms from the common sore or venerola at all.

I was consulted some fifteen years ago by a medical man in the case of a patient of his with very obstinate venereal—a very large sore, in fact, which would not heal. I learned that the unfortunate young man had had one course of mercury, and then, under further advice, a second; and finally, from somebody else, a third course of the mineral. The sore was inflamed and ragged, and about as ugly an affair as you might see in a day's walk; yet there was one paramount feature about it that quite satisfied my mind that all was wrong in the treatment; there was the elevated mound or edge of venerola. I said, let it alone, and it would get well; and so it did. I remember now a second case of venerola of the same kind, where three courses of mercury had been also administered with all due form and solemnity. Four or five months had elapsed; the ulcer was still unaltered: I saw

it at the end of the third course. I advised to throw away the mercury, as that was the only thing preventing the sore healing. This was done, and the man got well. Now, I believe most conscientiously I could tell you a hundred such cases; so do not be deceived as to putting your patients under mercury. In fact, mercury is not more required for what are called syphilitic diseases than for any other class of diseases; and in this special sore, which produces no sore throat, no eruptions of any kind, no diseased nose, &c., mercury is not required at all. But some of you will say, "This is all very old; this was all known before, and needs no iteration." Most certainly not to Hunter or Abernethy. The two inseparable ideas, mercury and syphilis, I need not say, have taken up the same corner in your own minds. Since you were first apprenticed as youths in the profession, these twin ideas have grown with your growth and strengthened with your strength; Gog and Magog were not so inseparable, bark and ague, sulphur and certain cutaneous parasitic curiosities; and yet I believe mercury, as regards syphilis, the greatest curse of a cure, and about the most useless thing as a remedy ever discovered. When I had a large practice in the out-patients' department of the hospital, many of you may remember I had a remedy of my own for syphilis—bread pills; and with two of these bread pills night and morning, for venerola or common sore, I ordered a pretty stiff dose of camphor mixture at twelve o'clock in the day! I do not desire you to do exactly the same, but such practice will afford useful hints as to dosing your patients with mercury. Believe me, also, you cannot get mercury out of your patient's system as easy as you think. Saw a long bone in two—a femur, for instance; put some mercury into it; and now try to get it all out again. You cannot do it. In the same way, mercury will remain for years and years, and pervade all the bones.

Of the many and many cases I might tell you, as to the evil effects of mercury, I would just mention one. A young lady, a friend of mine—as young ladies will—began to ail very severely of pain and fulness about the bowels; but a fashionable doctor—I am sorry to say there are a great many "fashions" in medicine—pronounced it "liver;" there was a flaw about the liver, and this unhappy, but fashionable young lady was put under two systematic courses of mercury. Another doctor, or surgeon, called in, ordered strong enemata of turpentine, and all sorts of things; and after clearing out the bowels well, she got rid of the liver symptoms, and abdominal tumour. But now a new train of miseries set in, worse than the first; she had rheumatism in all her bones, for the first time in her life, and every one of her thirty-two teeth dropped out. We see something like this every week in practice, so that there can be no doubt of the evil effects of too much mercury; who cannot see the concatenation of too much mercury—rheumatism, pericarditis, heart disease, &c.?

I would now like to say a few words, in conclusion, of inflammatory attacks to which the common sore, or venerola, is subject, and then

recapitulate what we have stated as to the signs and diagnosis of this form of disease generally. You have fallen somewhere or another, no doubt, on the not very elegant terms "black pox;" well, according to Evans, Welbank, and Carmichael, it is nothing more than this common sore of venerola in a state of inflammation and sloughing, almost amounting to gangrene, but is not gangrene; the discharge is profuse, pain very great; to the uninitiated it looks like "gangrene of the glans," but it is not this. Your treatment of such a case is very well marked, and most satisfactory. You should put the patient under chloroform, then, with a grooved director, slit up the prepuce, as you see it often done up stairs; next give the patient a full dose of opium, and you will see very little more of this black pox. Poultices, of course, and support, in shape of broth and wine, for your patient. Evans and Carmichael, I believe, say it is peculiar to venerola; but I fancy it is a complication of any other form of venereal sore as well—something constitutional added to the previous sore. Let me now recapitulate the points we have dwelt on, and which you should impress upon your memory. The common sore, or venerola, is met with ten out of twelve times of all venereal sores; it occurs as a pimple on the third or fourth day; it is marked by an elevated edge or mound, and is followed by no secondary symptoms: it is a sore that will maturate or go on through certain stages, in spite of all you can do to prevent it. Mercury, as a remedy, is unnecessary, and quite useless or incompetent to cure it. Condylomata are mere modifications of the granular condition of the sore. Gonorrhœa is also allied to it; the bubo is not the same as the bubo of true syphilis. Mercury may arrest, but not cure the sore, as the latter will go on where it stopped as soon as the mercury is stopped; and lastly, that this black pox is merely a phagedænic or inflammatory condition of the same sore.—*Association Med. Journal, March* 29, 1856, *p.* 251.

98.—IMPROVED METHOD OF TREATING BUBO AND SYPHILIS GENERALLY.

[No inconsiderable differences of opinion are found even amongst the most sagacious surgeons on the subject of syphilis; yet in many of our largest hospitals we observe that greater simplicity in the treatment is now the rule. A case of bubo at St. Thomas's Hospital is deserving of a short notice.]

Bubo is one of those half-way houses, so to speak, midway between the primary and secondary conditions of venereal disease, about which mercurialists and non-mercurialists agree to differ very little, poultices and blisters being the usual remedies. A new mode of treating bubo, adopted at St. Thomas's, and shown to us this week by Mr. South, is deserving of notice, as a point of practical importance and novelty. The theory, we believe, is, that the lymphatic in the groin is a sort of

chancre, or the stopping place of a certain amount of poisonous infectious matter from a sore; that this infectious matter, thus in process of elaboration, sets up suppurative inflammation *round the gland*, in the well known form of troublesome suppurating bubo, while another quantity passes into the system, poisoning it, and provoking secondary symptoms. Mr. South removes the peccant matter (by a sort of acupuncture of the bubo) with a grooved needle, which permits the fluid of the gland to drain away, so as not to reach maturity as a poison, or become absorbed. There seems very little doubt, as established by Ricord, that the (poisoned?) contents of the lymphatic vessel itself in the lymphatic gland enlarged, is different from the common suppurative enlargement of the rest of the gland. There seems very little or less doubt that a great deal of the syphilis of plates and books is factitious, and the result of mercury and this other poison thus elaborated. These inguinal glands, it need scarcely be said, are found in two groups, one of small extent, situated along the line of Poupart's ligament, usually the seat of bubo, as receiving the superficial lymphatic vessels from the genital organs, this line of Poupart's ligament being the battle-field of the syphilographers; while another group of larger glands, clustered around the internal saphenous vein, near its termination, receive the lymphatics from the lower extremity. We once saw severe bubo in these glands in a poor young married woman, a nurse, who was attended during her previous confinement by a midwife who had a large chancre on her right hand. One sees an immensity of syphilis cases at Guy's, at St. Bartholomew's, at the London Hospital, &c.; and we cannot help saying that mercury and mercurial fumigations are gone almost entirely out of fashion, as well as the manifest indecency of syphilitic inoculation.

T. M., aged 18 years, was admitted, under the care of Mr. South, at St. Thomas's Hospital, July 2nd, with symptoms referrible to ordinary syphilis and bubo. The latter has been punctured three times during a month, and large quantities of fluid followed each operation, so much so that he has to keep a supply of old rags to dry up the lymphatic secretion. The ordinary suppurative inflammation, however, has been checked, and the lymphatic gland is now reduced to its normal size: in other words, the bubo has been prevented from "coming to a head"; and, with the aid of a few Plummer's pills, which Mr. South ordered as a matter of form, to sweeten the blood, as the patient required them, the cure is quite satisfactory.

The views of Skey, Carmichael, Evans, Ricord, &c., are gradually superseding the mistakes made as to the Hunter chancre, as this sore is seldom or really never at all seen in hospitals in the form once described, but not by Hunter.

At Guy's Hospital especially, the treatment of syphilis cases by Mr. Cock and Mr. Birkett is very simple. At Bartholomew's Mr. Skey, at University College Mr. Erichsen, at St. George's Mr. Hewett, tend far and widely away from the mercurial plans so much in vogue once

at St. Thomas's, and still, it is said, at the Lock Hospital and King's College, as well as in the *clinique* of Mr. Lawrence—the opposite of Mr. Skey at St. Bartholomew's.—*Association Med. Journal, Aug.* 23, 1856, *p.* 715.

99.—ON LARGE DOSES OF OPIUM IN OBSTINATE CHANCRE.

By M. Rodet.

M. Rodet observes, that the general conclusions to be drawn from the observations of writers on syphilis are, 1. That opium, conjoined with mercury, in the treatment of bad chancres, acts as a powerful auxiliary. 2. That it often cures ulcers of this description that have not yielded to mercury. 3. That it may ameliorate, but not cure, such ulcers, when given alone, and without having been preceded by mercury. 4. That it is well suited for assuaging the inflammation which complicates syphilitic accidents.

After considerable employment of it in such cases, he has himself come to the conclusion that it is an error to regard it as a mere succedaneum of mercury; it acting, in fact, most efficaciously in just those cases in which mercury is of least use, and *vice versâ*. Thus, in constitutional syphilis, it acts as a mere corrective of the powerful specifics with which it is conjoined, and should only be given in very small doses. Here, as also in the case of indurated chancre, given alone and in large doses, it not only would do no good, but might do great mischief. When, however, the chancre manifests any tendency to phagedæna, or is irritable and painful, mercury should be rigidly forbidden, while opium is always useful in assuaging the pain, diminishing the irritability, and modifying the suppurative process. But the case in which truly remarkable effects are produced by opium, and in which it acts almost as a specific, is that of *phagedænic, serpiginous ulcers.* These are fortunately rare. All those met with by the author have succeeded to a virulent bubo, which empties itself of a sanious discharge. The bottom of the ulcer is greyish, pultaceous, and irregular. Its edges are raised, very jagged, and deeply detached, so that the ulcer is always much larger than it appears to be at first sight. If the edges are raised up, we may observe, at several points, infractuous cavities, irregularly disposed, and filled with sanies and organic debris. These result from a chancrous erosion, which seems to act by destroying the tissues circularly around several partial centres. The general progress of the ulcer consists in its extension from the centre to the circumference, its edges being formed by partial, semicircular ulcerations, each having its particular centre, and extending from this to the circumference. These partial ulcers do not extend uniformly, some progressing much more rapidly than others, giving always an irregular form to the principal ulcer. Not only do they destroy the subcutaneous tissues, but they also gnaw away the deeper surface of the skin, rendering it

more and more thin, until at last it disappears. Sometimes it is the free edge of the skin that first disappears, and, at others, the portion corresponding to the small *cul-de-sac* of the little ulcer, so that we then see around the circumference of the principal sore one or several little ulcers, with notched and everted edges, which look like chancrous pustules accidentally developed around this ulcer. Once formed, these little sores continue to enlarge until the skin separating them from the large one is completely destroyed. But, as these small ulcers become confounded with the original ulceration, other partial ulcerations are produced in the same way. To these others succeed, and so on, for an indefinite period. Ulcerations of this kind may persist for years, laying waste vast regions, extending from the inguinal region along the upper part of the thigh, the hypogastrium, the scrotum, perinæum, or the buttock. The irregularity of their form is usually greater in proportion to their extent, and is shown in advancing and retreating angles, and sinuous and irregular lines, which cannot be more accurately compared than with the lines of certain shores as depicted on geographical maps. The sore progressively cicatrizes over as it extends, fresh ulcerations simultaneously breaking out, so that an actual displacement from its original locality has taken place. Sometimes, the cicatrices are only partial, forming a kind of islets; but such cicatrices are sometimes destroyed by the ulceration taking a retrograde course. Generally, the surface of the ulcers is violaceous, and formed of softened tissue devoid of vitality. The edges are always more irritable than the centre, bleeding easily, sensitive to the slightest touch, and the seat of incessant pain of varying degrees of severity. These ulcers never give rise to constitutional symptoms, whatever their extent or duration, but the patient becomes gradually enfeebled, and falls into a state of marasmus, his spirits being at the same time much depressed. The appetite and digestion are feeble, sleep is interrupted, the skin becomes dry, and the countenance assumes a leaden, roughened aspect.

No form of syphilis resists the action of remedies with such tenacity as do these phagedænic serpiginous ulcerations. M. Rodet, prior to resorting to large doses of opium, treated them by a great variety of means, without any satisfactory result. The cyanide of potassium, although incapable of healing them, effected considerable amendment in their appearance. The iodide of potassium was found to be of no avail; and those who believe in its efficacy have confounded these primary ulcers with other serpiginous ulcerations, which much resemble them in appearance, but which appear during the tertiary period of syphilis. As to mercury, not only is it useless, but mischievous, and should be rejected. When the ulcers decidedly manifest the appearances above described, opium exerts a most beneficial effect upon them. In less well-marked cases, it is also useful, but its efficacy is not so complete. For this remedy to succeed, therefore, it is necessary that the case be properly chosen, and that it be administered with certain rules and precautions. M. Rodet prefers the gummy extract to any other pre-

paration, and always commences with small quantities (as 5 or 10 centigrammes), in order to ascertain whether the patient will bear the remedy well. This quantity must be increased gradually, and somewhat rapidly, as every second or third day; for, when the increase is made too slowly, the effect is far less satisfactory. Not only must the dose be increased at short intervals, but also somewhat suddenly, as the economy has not then time to become habituated to the action of the remedy, which then exerts upon it more rapid and more complete modifications. Such increase must be continued until the therapeutical effect is produced. When the ulcers are covered with granulations, and tend to cicatrization on every side, further increase is uncalled for; and, when the sore has taken on the aspect of a simple ulcer, we pursue a retrograde course, diminishing the quantity more or less rapidly until complete cicatrization is obtained, when the opium must be left off.

If some obstacle impedes the progress of cicatrization, the opium does not operate against this, which has to be removed by other means; and the neglect of this precaution may lead to the loss of much time, and to the taking of large unnecessary quantities of opium. The opium must not be given in too divided doses, as, if the stomach be kept too constantly under its action, digestion is interfered with. The entire daily quantity should be taken at two doses, morning and evening, leaving a sufficient space of time after meals to secure the completion of the digestive process before administering it. If this is not attended to, indigestion, accompanied by nausea, vomiting, diarrhœa, sweating, prostration, or cephalalgia, &c., comes on; compelling a temporary cessation of the remedy, and reacting unfavourably on the ulcer. Sometimes, notwithstanding this precaution, the stomach becomes fatigued, and digestion is indolent and accompanied by nausea. This inconvenience is easily avoided by recommending the patients to take light wine with their meals, proportionate to the quantity of opium employed. Thus, suppose the quantity of opium taken daily, amounts to 15 grains or thereabouts, from a pint to a quart of wine should be allowed. The wine not only corroborates the functions of the stomach, but exerts analogous effects on other organs. Thus constipation, so common a consequence of taking opium, is almost certainly obviated by this means, and an excess of sleep is quite exceptional. The wine is, indeed, an indispensable corrective of opium when given in large doses. If, in spite of all precautions, the head becomes heavy or painful, the conjunctiva injected, or other signs of cerebral congestion appear, the opium must be at once left off, mustard poultices applied to the limbs, and the question of leeching the anus or of general bleeding taken into consideration. If diarrhœa occurs, which is rare when wine is given with the opium, it is usually obstinate, but, refusing to yield to astringents, it does so to ipecacuanha given in emetic but divided doses.

As under the employment of the opium in these cases, the general health becomes rapidly meliorated, it is evident that it exerts a power-

ful action upon the entire economy. M. Rodet furnishes the details of two of his cases. In the first of these, the daily quantity of 10 centigrammes of opium began with on November 9, was gradually augmented to 80 on December 6, and to 90 on January 21, thence descending again to 60 on February 3. In the other the quantity of ten centigrammes, began with on January 19, was raised to 80 on March 21, and then diminished by 5 centigrammes every 5 days: but relapse occurring in this patient, we find him taking from 40 to 60 centigrammes during November.—*Bull. de Therap.* xlix., p. 529-541.—*Med. Times and Gazette, August* 16, 1856, *p.* 177.

100.—ON SECONDARY SYPHILIS, TREATED BY A NEW PREPARATION OF IODINE.

By J. C. Christophers, Esq.

[We sometimes meet with cases of secondary syphilis which resist the usual preparations of iodine. The object of this paper is to bring before the notice of the profession a new compound, which combines all the advantages to be derived from iodine, while it is devoid of its bad effects, and has proved very valuable when other combinations have failed.]

My experience of the action of this remedy is limited to cases of secondary syphilis; but in the hands of some other surgeons, I am told, it has been found efficacious in cases of scrofula, anæmia, and in the furunculoid plague which has infested this city during the last three or four years.

To Mr. Hockin, the chemist, in Duke-street (who manufactures it under a patent granted to M. Dupont), I am indebted for my knowledge of this preparation, and for its formula. There, are, indeed, two preparations: the one (that which I have found so useful in treating cases of secondary syphilis) he names "liquor cinchonæ hydriodatus:" the other (that which has been found useful in treating boils, anæmia, and scrofula), "liquor cinchonæ hydriodatus cum ferro." The former contains in one fluid drachm of liquor, twelve grains of cinchonæ flav., and one grain and a half of iodine, in the form of hydriodic acid. The latter contains, in addition to the former ingredients, one grain of protoxide of iron in each fluid drachm of the liquor. These preparations are produced by exhausting the powdered bark with an aqueous solution of hydriodic acid; then with water, and the liquor is subsequently evaporated to the above bulk.

The circumstance that the iron compound ever remains in a state of proto-salt, and that the liquor never, either by time or exposure, becomes inky, through the action of the tannic principles in the bark, goes to show that there is here something more than a mere mixing of ingredients, and that some new combination of iodine, the cinchona alkaloids, and the peculiar tannic principles exists in it, which the fact corroborates, that the same materials act differently when used singly, together, or when otherwise combined.

The dose in which I have prescribed these preparations varies from one drachm to three drachms of "the liquor cinchonæ hydriodatus," and from fifteen minims to two drachms of "the liquor cinchonæ hydriodatus cum ferro;" and in these doses I have not found any of the evil effects arise which smaller doses of other preparations of iodine have been known to produce.

I must not omit to say (inasmuch as I attach much importance to its use), that in some of the successful cases treated by means of the preparation described, I have also employed the hot-air apparatus, in order to produce profuse sweating, and always with marked good effect. Indeed, I do not know a more potent remedy for intractable and inveterate cases of secondary syphilis than this is.

The ancients recognised the great advantage of sweating their patients when treating them for this disease, and most of the authors of an early period prescribe it as a remedy, and some of them give elaborate directions for producing and for prolonging its effects. They describe the sweating by medicines, sweating in bed, sweating in a hot-house (whenever it can be procured), and sweating by labour, and either of these processes they designated the "sweating course."

It has occurred to me to find that it is far more difficult to cure secondary syphilis in the higher than in the labouring classes, and I have thought that the daily occupation of the latter, whereby the skin is forced into constant action, may in some measure account for it.

Opium was at one time considered to be a specific for syphilis I have found it useful, and most so in those cases in which it produced free perspiration—its very usual effect.

The use of the hot-air bath is impeded by the thought that it entails a difficult and complicated apparatus, and that it cannot be used by the patient when at home. It is not so. Few things are more simple, easier of access, or less costly than it, and the patient can be submitted to its action in his own bed. There are many forms: one of the most simple was employed by Dr. Wilson, in the Middlesex Hospital, with good effect; another by Mr. Kurtz, a chemist, at Liverpool. The former was employed for sweating only; the latter for sweating, and for the administration of iodine and sulphur.—*Lancet, August* 9, 1856, *p.* 160.

101.—ON THE COMMUNICABILITY OF SECONDARY SYPHILIS TO THE FEMALE PARENT, ENTIRELY THROUGH THE FŒTUS.

By Dr. James D. Balfour. (Read before the Obstetrical Society, Edinburgh.)

[It is well known that the syphilitic taint once acquired is communicable to the children of those thus affected; but it is not so generally acknowledged, that secondary syphilis may be communicated

to a female, should she become pregnant by a man whose system still retains the syphilitic taint, without her suffering from the primary form of the disease, but arising entirely from the taint which exists in the fœtus, because we know that unless she does become pregnant she exhibits no such symptoms. The history of the following cases will sufficiently explain this; we shall then inquire whether the syphilitic taint, which remains in the mother afterwards, is such as to require the use of remedies to remove it:—]

The first case I will mention is that of a young lady, who was of a strong healthy constitution, and who never had any syphilitic affection; indeed, her position and her history precluded the idea of such a disease ever having existed. She was married to a young gentleman, in good circumstances, who at the time of marriage exhibited no signs of syphilis, either primary or secondary, although subsequently, during his wife's second confinement, I learned from him, that several years before his marriage, he had chancre, and this was followed by secondary symptoms, which, however, were slight, and soon removed by medical treatment. His medical attendant informed him he was perfectly cured; and he had since then neither seen nor felt any symptom of the disease.

For several months after marriage the young lady continued quite healthy. About the fourth or fifth month after being married, she became pregnant; and about two month after this she consulted me. She had observed for some time small scaly spots appearing on various parts of the body, and she complained of several hard swellings about the perineum, which were painful. The eruption, which was chiefly about the neck, arms, and legs, was characteristic of syphilitic psoriasis. The hard lumps, at first confined to the perineum, gradually extended to the vagina, and increased in size. There never were any sores about the parts; but she complained much of a burning sensation in the lumps, and of great itchiness. I continued to attend her up to the time of her confinement, and delayed any active treatment till after this event should be over, contenting myself with recommending palliative measures, and such remedies as would not interfere with the life or development of the fœtus. She had an easy confinement at the full time, and gave birth to a fine large child, which, however, in about eight days after birth, exhibited unmistakeable evidence of the syphilitic taint, and was treated accordingly with perfect success, all appearance of the disease disappearing. By the time the lady recovered from her confinement, and the lochial discharge had ceased, all trace of the syphilitic affection was entirely left, and she was so completely restored to health that I did not deem any medical interference necessary. She enjoyed excellent health, and made a good nurse, and she continued quite free from any return of the disease for more than fifteen months, when she again became pregnant. About two months after this occurred,

a train of symptoms precisely similar to the first appeared, and continued as formerly up to the time of her confinement, when they again disappeared, as on the former occasion. The second child was also syphilitic, and the same remedy, as in the first case, was employed with perfect success. When the symptoms occurred on the second pregnancy, I communicated with the husband, and told him I suspected he must be labouring under some syphilitic affection, when he stated to me the facts I have already mentioned. I at once, with his own consent, put him under treatment, with the prot. iodide of mercury, and other remedies, in order to remove any taint remaining in his system; and after his wife's recovery, I put her under a similar course of treatment for some time. Shortly after this they removed to a different part of the country, and she passed into the care of another medical man with whom I was intimately acquainted. At the husband's request, I communicated to him the circumstances which I have now mentioned. Since that period, she has been twice pregnant, and on both occasions born fine healthy children; and my medical friend informed me that she had never had any treatment after she left my charge, and that on neither occasion had she suffered from any symptoms of a syphilitic nature, nor had the children shown any sign of the disease. More healthy looking children you will scarcely meet with.

The next case is that of a respectable young woman from the north, who was married to a tradesman, who had no trace of a syphilitic disease at the period of marriage; but he afterwards acknowledged, that two years before, he had the disease, followed by slight secondary symptoms, which had entirely disappeared under medical treatment, and he had seen or felt nothing since. This woman complained of nothing until about three months after she became pregnant; then, however, symptoms of secondary syphilis became apparent; spots of psoriasis appeared on various parts of the body; hard knots were felt on the perineum, and on the external labiæ; and within the vagina there was a hard knotty feeling over the whole mucous surface. Her child exhibited a distinct syphilitic appearance, which was removed by the usual treatment. Shortly after delivery, all symptoms of syphilis entirely disappeared; and as she shortly afterwards removed to the country, she was subjected to no medical treatment. A few months afterwards her husband died. She subsequently married a farmer. About six or eight months since I saw her, and she has born three children to her second husband, and certainly more healthy children I could not wish to see. She informed me she had never been under medical treatment since I had attended her, indeed she never had a medical man near her, except during her confinement; and she at same time stated, that she had never suffered, during any of her pregnancies, from anything like what she had done at the first one.

The next case is one very similar to the first in the symptoms which

manifested themselves. The young woman was one of most unexceptionable character, and was married to a highly respectable young man. He had syphilis in a mild form, followed by secondary symptoms, six years before marriage, for which he had been under the care of a medical man, and he believed himself to be perfectly free from the disease, as he had been quite well since. His wife became pregnant some months after marriage, having up to this time been perfectly healthy, and free from all complaint. A few weeks after pregnancy had taken place, she began to suffer from a burning pain in the region of the perineum and the vulva. Hard lumps soon made their appearance, and some spots of psoriasis appeared on the neck, and at the roots of the hair of the head and around the vagina, but none on other parts of the body. These continued in a greater or less degree till after her accouchment, when they entirely disappeared. The child exhibited the syphilitic taint some days after birth, and was treated accordingly. This woman never got any anti-syphilitic remedy; but, during the latter months of the wife's pregnancy, I put the husband under regular medical treatment, after having heard from him the facts I have mentioned. That this treatment was effectual, appears to be proved by the fact, that his wife bore a second child, and she did not suffer during her pregnancy from any of the former symptoms, nor did the child show any signs of syphilis. After this they passed from my care, and I have not been able to trace them since.

The next case is incomplete, as I left the district before the woman was confined, and I have not since had an opportunity of ascertaining how the case terminated, or how she has been since; but, as I expect yet to be able to do this, I will give the case so far as it came under my notice. Her husband, twelve months before marriage, came under my care, suffering from a severe attack of syphilis. The sores were completely cured, but he was still under treatment for the secondary symptoms, which had made their appearance, when he gave up the use of all remedies. He afterwards got married to a respectable girl, who was a stout healthy young woman, who soon became pregnant by him. About six months after this she sent for me. She was then labouring under all the symptoms of secondary syphilis. There was great swelling and hardness of all the external organs of generation, and also hard lumps, with psoriasis eruption covering them on the perineum, and distinct appearance of psoriasis on various parts of the body. She stated, that she began to find those symptoms first about six weeks after she became pregnant, but she had paid little heed to them until now. She was now, however, obliged to send for me, as she said she could hardly either sit or walk from the intense burning pain in those parts, and also the almost intolerable itching, which became worse when she went to bed, and prevented her from sleeping. I used palliative measures with great benefit to her, but without any diminution of the swelling, or hardness, or decrease of the psoriaris; and, as I have already mentioned, I left the district before her confinement, so that I can say no more about the case at present.

I might mention one other case, but I refrain from doing so, as, after a minute and careful examination into the history of the wife, I learned circumstances which did not place her character above suspicion, and I would not, therefore, found upon it as any proof in settling the point under discussion. In the others I have brought forward, I am thoroughly assured that the character of the females was above all suspicion, and the syphilitic taint arose in each case entirely from the husband.

These cases appear to me to prove clearly, that although syphilis existed in the system of the husband, it was in such a condition that it could not be communicated to the wife by mere coitus—but as soon as pregnancy took place, the disease was communicated to the fœtus, and after lying dormant in it for a few weeks, it began to manifest itself in the body of the mother, being communicated to her through the fœtal circulation—the blood from the fœtus containing the poison of the disease derived from the other parent.

There is a question, however, which these cases suggest to my mind, and which to me appears to be one of great practical importance, viz.—After the syphilitic poison has been communicated to the mother through the fœtus, and has developed itself in her in the form of secondary affections, does that poison continue to exist in the system of the mother (similarly to what it had done in the other parent) after the child is born, or, in other words, after the source from which the poison was derived has been removed from the body?

I am inclined to think it does not, and the cases brought forward seem to bear me out in this; although, I must acknowledge, they are too few fully to establish this point. In the first case mentioned, both parents were put under anti-syphilitic treatment, and since then no taint has appeared—but then, it is very striking, that on both occasions of pregnancy the symptoms entirely disappeared immediately after the child was born; and, on the first occasion, no treatment was adopted, and yet they did not reappear until pregnancy took place a second time, or until the source of the poison was a second time introduced into the system. In the next two cases, however, any source of fallacy which might arise from the mother being put under treatment to remove the poison from her body, is entirely removed. In the first of these, no treatment was adopted—her husband died in a few months after her confinement—she married a man who had no syphilis—and although she has born three children to this man, neither she nor these children have ever exhibited the slightest signs of a syphilitic character. In the other case again, the husband alone was subjected to treatment; and although I can only speak of one subsequent pregnancy, yet during that she showed no signs of a syphilitic character, nor did the child, and both mother and child had done so on the first. The next case, of course, being incomplete, cannot be founded upon, but I will ascertain its history also, if possible. (This case also goes to confirm the same point, as all symptoms left immediately after

confinement, and she has been free from any appearance of the syphilitic taint ever since. She has not again become pregnant, but as the husband has been subjected to no treatment, I will continue carefully to watch this case.) But what I have mentioned are, in my opinion, very strong facts, and go to establish the question which I have propounded, in the negative; and although the data are perhaps too few fully to establish my theory as correct, yet I think they are of such an interesting nature as to call our attention to this subject, and make us take the most particular note of every case which may come under our observation bearing upon this affection—one which, I am afraid, has not received from the profession that consideration it deserves.

There is another question which suggests itself in connection with this subject. How long, after impregnation takes place, is it before the poison shows itself in the system of the mother? I am sorry, that in the cases which I have brought forward, I did not pay more particular attention to this point—that I did not, in fact, inquire the exact time when the first symptoms were observed in each. In all of them, they stated it was some weeks after they were aware of being pregnant, before these symptoms were observed, but then they appear only to have taken notice of them when they gave uneasiness; they may have existed before, although, as in the case of the last patient mentioned, it was only in the sixth month of pregnancy she consulted me about them. It would appear, however, that some time does elapse, and that considerable, after impregnation, before they show themselves. Whence, then, does this arise? Does the poison not begin to develop itself until the fœtus is somewhat advanced? Or is it not introduced into the mother's system until the communication between her and the fœtus is more maturely formed? I merely suggest these questions as points of some interest connected with the subject, but I would not, without more sufficient data, venture even to suggest a solution of the questions, or even to state positively whether the poison at once begins to become absorbed by the mother or lies dormant for some time in the fœtus.—*Edinburgh Medical Journal, Oct.*, 1856, *p.* 315.

102.—MERCURIAL FUMIGATIONS.

By Dr. Jonathan Green.

[Dr. Green has given very great and almost exclusive attention to every variety of fumigation, which he believes to be of much importance, and strangely overlooked by many practitioners. As an addition to Mr. Lee's paper, he says that]

Mr. Abernethy, in his lectures—1815 and 1817—was a strong advocate for mercurial fumigations, and introduced their use at St. Bartholomew's Hospital, much after the method of Chevalier Laluette, who had practised with them in 1776. Several other persons have

successively practised with their aid, mostly in syphilitic cases, at various hospitals and in private practice; but owing to the first expense of apparatus being heavy, and the trouble and constant attention required for the due administration of them, and not for want of real value in the remedy, the practice has not been sustained, nor become general, as it deserves to be, and has fluctuated between adoption and abandonment for three parts of a century. Mr. Langston Parker's work on the subject, in 1850, did much to awaken the sleepiness that existed on the matter. I never knew but of good results from any that have essayed the practice, which I believe is as important as a medical agent, as it has been strangely overlooked by many practitioners.

The mode of fumigating, with Mr. Lee, is exceedingly simple, and much after the manner of Mr. Langston Parker. It consists of a lamp, with one or more burners; the fuel is spirits of wine, the flame impinging on a thin metallic plate, on which is placed the mercury to be volatilised. The patient is seated on a caned chair, the lamp and mercury in action under him; the whole is covered with a blanket, and vapour from water is introduced at pleasure. Thus seated, the whole of the patient's body is exposed to the action of the mercurial gas and heat from a quarter to half an hour, and the fumigation is over, to be repeated as need be.

Now, of the good obtained by these simple means I can bear witness; I confess I was surprised at the effects I saw produced by them, being much the same as those arrived at by my own expensive and scientific apparatus. I tried the same plan afterwards at my own house, using the same lamp, and the *modus operandi* at once became apparent, I may say palpable. I did not get so much heat as I wished, but I found the mercurial gas coming through the texture of the blanket, and evident to the taste; in short, I was inhaling the mercury all the time I was under the process. Another circumstance I learnt at the Lock, but which did not surprise me—viz., that a relapse after cure of syphilitic cases by these means is so rare that there they have none on record. This coincides with my own experience, and is also brought forward strongly in the work of Mr. Langston Parker. But a still more extraordinary fact requires to be noticed, namely, that when you fail to bring on mercurialism by the fumigations, the patients commonly are getting and do get well; although at the time, or subsequently to the cure by mercurial fumigations, no ptyalism has been produced. This I believe may be accounted for, agreeably with the enlightened views of the day; but I leave this point for the consideration of pathologists, your space being too limited for detail.

As regards the various preparations of mercury used in fumigations, and the quantity of dose used, a few words may be useful. I do not recollect what was the nature of the preparation used by Chevalier Laluette. Mr. Abernethy used the live quicksilver, or calomel, but

ultimately confined himself to the use of the grey oxide, of which he ordered from one to six drachms in each fumigation, and the calomel he would use from one drachm to three drachms in each dose. These two latter preparations are what I prefer for my own use. The grey oxide is often inert, hence the large quantities used by Mr. Abernethy. I have scarcely ever used more than three drachms for the dose, and of late years have made it for myself. It is seldom to be procured from the most careful chemists twice of the same colour, or from the same chemist twice alike. Perhaps there is no great evil in this variation of colour, as I find it is consequent on the lime-water, ammonia, or alkali used to neutralize any excess of acid that might remain in making the chloride of mercury, from which the grey oxide is procured. The great and indisputable success of Mr. Lee's practice is produced from very small doses of calomel, from five to fifteen grains in each fumigation, but then, as I have stated, his patients inhale the mercury during the process. Of my own success in the treatment of syphilitic cases by mercurial fumigations I with confidence appeal to the experience of Sir Benjamin Brodie, Dr. Scott, Mr. Coulson, and numerous other medical gentlemen. The nitric oxide and other binoxides, iodides, and sulphurets of mercury, I never use from choice; they require great heat to vaporize them, and occasion troublesome coughing to the patients.

It is to be lamented, especially by the suffering part of the community, that the varied kinds of fumigations, duly modified, are not more frequently brought in aid for the relief of various ailments. The sulphur fumigations, properly directed, are invaluable for the majority of cutaneous affections, rheumatism, &c., and the chlorine fumigations are of a like value in the treatment of liver cases, and in obstructions and congestions of the internal organs generally. Reference to the above high authorities will substantiate this statement, and these remarks I add advisedly, knowing that time will prove their correctness.—*Lancet, August* 16, 1856, *p.* 206.

103.—*Injection of Balsam of Copaiba in Gonorrhœa.* By M Dallas.—Mr. Dallas, of Odessa, states, in confirmation of the observations already published by Taddei, Marchal, and others, that the injection of balsam of copaiba is the most efficacious mode of treating gonorrhœa. In sixteen cases he has so employed it, using no internal remedy, either in recent or old gonorrhœa, with complete success. His formula is copaib. five drachms; one yolk of egg; gummy extract of opium, one grain; water, seven ounces. The injection should be used several times a-day.—*British and Foreign Medical Review, July*, 1856, *p.* 265.

104.—*Bucha in Gonorrhœa.* By Dr. Henry Hancox.—I have found from extensive experience that the bucha is quite as efficacious

as the balsam of copaiba; consequently it is preferable, as it does not possess that disagreeable odour so objected to by patients, nor can the friends of the patient be aware, by an inspection or smell of the medicine, of the nature of the complaint under which the individual is labouring. I have treated during the last twelve months upwards of one hundred cases of gonorrhœa by the administration of the infusion with the greatest success, rarely having recourse to injections, except where the disease has been neglected for some time.—*Lancet, August* 16, 1856, *p.* 208.

105.—ON THE EMPLOYMENT OF COLD IN GONORRHŒAL EPIDIDYMITIS.

By Prof. Sigmund.

Whatever may be the success attendant upon the treatment of gonorrhœa in recent times, the number of cases of epididymitis does not seem to be diminished. Prof. Sigmund published in 1850 an account of the advantage he had derived from treating it with cold, and all his subsequent experience has confirmed the statements he then made. Under the term he includes the inflammatory condition of the tunica vaginalis, of the epididymis itself, and of the cord, the affection of one of these parts preponderating in different cases. The form in which the tunica vaginalis becomes rapidly distended with exudation is a very painful one; that in which the inflammation of the epididymis preponderates is less so, and when there is considerable effusion into the tunica and around the epididymis, which cases are, however, rare, the suffering is excessive, and is accompanied by general disturbance. In all degrees and combinations of the affection, cold is found to be a powerful remedy, assuaging pain, preventing farther effusion, and, when continuously applied, expediting absorption more than any other means. The patient lying on his back, the scrotum is supported by means of a light suspensory, or a towel placed between the thighs, and then covered with compresses dipped in water. For the first three or four hours, the degree of cold should be only moderate, lowering the temperature then gradually, and in six or eight hours adding ice, if the application acquires heat rapidly. This degree of cold is continued as long as it gives the patient relief, but when it ceases to do so, and still more when it induces an uneasy sensation, the temperature must be raised from cold to merely cool, and the application allowed to remain on until it becomes warm. Finally, lukewarm applications are to be continued until all inflammatory appearances have subsided. The application must be constant, continuing it uninterruptedly day and night, its occasional use not sufficing. There are persons who cannot bear the application of even moderate cold, and especially when made to the abdomen, without colic, diarrhœa, catarrh, rheumatism, &c., being induced; and this is especially the case with those disposed to scrofula, tuberculosis, rheumatism, or gout. It is found, however, by

experience, that even very sensitive persons will bear well-wrung compresses, providing that the degree of cold be gradually and slowly increased. Conjointly with this treatment, the patient takes a saline purgative at intervals, so as to induce from two to four fluid stools, one or two such being also procured during the diminution of the inflammation. For diet, the patient is to be limited to thin, easily-digested fluid substances, tea and coffee being prohibited during the acute stage. Young plethoric persons, in whom the symptoms run high, and are attended especially with much exudation around the epididymis, may, exceptionally, first require the application of leeches to the groin. Very severe, enduring, or increasing pain may be relieved by anodynes, and when the tunica vaginalis is much distended, a puncture or subcutaneous incision may be required; but such cases are quite exceptions, the cold proving, in the great majority, the best anodyne and antiphlogistic. At most, an anodyne is required at night, in order to secure sleep. When the inflammatory symptoms have disappeared, and the epididymis will bear the moderate pressure of the hand, we must seek to obtain the absorption of the exudation; and for this purpose, Professor Sigmund prefers Fricke's treatment to any other mode of making compression.

Numerous comparative trials have convinced him that the treatment of this affection by repeated bloodletting in nowise deserves preference, the employment of cold alone proving in its results far more satisfactory in the great majority of cases. When resorted to early, also, it exerts a very rapid effect in arresting the farther development of the affection.—*British and Foreign Med. Review, Oct.* 1856, *p.* 543.

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MIDWIFERY,

AND THE DISEASES OF WOMEN, ETC.

106.—ON THE TREATMENT OF PLACENTA PRÆVIA.

By Dr. Henry Oldham, Obstetric Physician and Lecturer, &c., at Guy's Hospital.

[From a great number of cases related by Dr. Oldham, illustrating the different methods of treating placenta prævia, he has drawn the following conclusions :]—

1. There are two kinds of bleeding in placenta prævia : the bleedings before labour, and the bleedings at the onset of labour and during the first stage—the former occurring at intervals between the sixth and ninth months, and sometimes not at all; the latter unavoidable.

2. The cause of the bleedings during pregnancy arises, not from what is called the development of the cervix—if by that term is meant the expansion of its cavity into the cavity of the body of the uterus—but from the general softening of its tissue, making it more yielding, and from the walls of its cavity being more widely separated by the accumulation of mucus within: and then, again, by the augmented volume of the utero-placental circulation. It is this latter—but feebly supported at the os uteri—which is liable, under any disturbing cause, to break through the decidua and lining membrane of the placental cell-texture, and so occasion a maternal placental bleeding. It is checked for a time by the coagulation of blood in the cell-texture, favoured by its temporary collapse, again to break forth, if not carefully guarded against by rest, diet, and general precautions.

3. The bleeding during labour is the result of the same form of laceration, combined with separation of the placenta from the uterus, and the consequent regurgitating hemorrhage from the uterine veins, and slightly from the torn arteries; the flooding from these sources being so copious and so exhausting, as rarely to allow the patient to survive delivery by the natural efforts. Occasionally, however, it does so.

4. The opening of the os uteri in placenta prævia is generally retarded, first, by the exhaustion from the profuse bleeding which accompanies the very first pains, and for the time weakens, and often suspends labour; and, secondly, because the labour force has to over-

come the additional resistance which the implantation of the placenta over the os uteri occasions; and hence, this part is commonly found to be correspondingly more dilatable than dilated.

5. In cases of partial placenta prævia, great confidence may be placed in rupturing the membranes and draining the ovum, with such stimulants to uterine action as are afforded by liberal support with stimulants, an abdominal bandage, and it may be ergot of rye, either by enema or by the stomach; but should a draining of blood go on, version should be performed.

6. In a larger or central placenta prævia, there is one method of treatment which excels all others for prompt and efficient relief, and to which all others ought to be subordinate, as rare and peculiar deviations from a general rule; and that is, to make a way to the membranes by introducing the hand within the uterus, separating the intermediate portion of placenta, and, at the same time, dilating the os uteri, bursting the membranes, seizing one foot, and turning by it. In selecting the time when version may be performed, the great thing to distinguish is the yielding or dilatable character of the os uteri; and, if this be present, the size of the disc itself, whether it be that of a shilling or a crown piece, is comparatively of little moment. It is too often a fatal delay, and a serious error in practice, to make the rule for the time of version depend on the extent of dilatation which the os has acquired.

7. In forced delivery, it requires great care that the dilating force be steadily applied, and evenly distributed, by the intelligent adaptation of the hand, so as to diminish the shock of forced delivery, and to guard the cervix from laceration, which may prove fatal from hemorrhage. The operation of version, when a foot is grasped, is generally easy; but in one case it was attended with remarkable difficulty.

8. Version is sometimes prohibited, from the immediate exhaustion of hemorrhage, or from rigidity of the os uteri, in spite of hemorrhage. In the former case, a good vaginal plug, aided in its action by a large perineal pad, and the free exhibition of stimulants, is a good temporary, but not always a permanent, resource,—version being sometimes required when reaction has succeeded. In the latter case, there is the valuable alternative of separating the entire placenta, so as to destroy the utero-placental circulation, rupturing the membranes, and exciting uterine action. This operation is difficult to perform completely, and sometimes impossible, from the wide diffusion of the placenta, or from morbid adhesion, or from both these conditions combined.

9. Occasionally, when the ovum is small, and the os uteri rigid, a knee or foot may be seized, without the introduction of the entire hand into the uterus, and the os be dilated by the pressure of the body and head of the child in the act of extraction, as practised by Dr. Robert Lee.—*Medical Times and Gazette, July* 12, 1856, *p.* 33.

107.—ON THE TREATMENT OF PLACENTAL PRESENTATIONS.

By Dr. W. Tyler Smith, Physician Accoucheur to St. Mary's Hospital.

[The most violent and dangerous cases are those in which no hemorrhage occurs up to the full time, when the vessels have reached their full size; sudden and extensive detachment takes place, and death may take place in a few minutes. When partial, the uterine vessels may contract and become blocked up by coagula, so as to arrest the hemorrhage: this may be repeated several times. In other cases, the cervical portion of the placenta may be entirely detached at the time of labour, and no serious hemorrhage occur after the first outbreak. Again, in some favourable cases, the placenta and fœtus may be expelled so rapidly that no dangerous loss occurs. But we must not depend upon this—to wait is generally to kill.]

The chief methods of treatment followed in cases of placenta prævia are—1. The use of the plug, or tampon. 2. Puncturing the membranes. 3. Turning the child. 4. The partial, or the entire separation and extraction of the placenta. I propose to point out in detail the cases and conditions in which these several modes of practice are applicable.

Plugging the vagina is adapted to cases in which, after the first loss, a continuous drain, varied by slight eruptions of blood, is going on, particularly when this occurs at the sixth or seventh month. By plugging the vagina with moderate force, the lower segment of the uterus is compressed between the plug and the contents of the uterus, and an impediment is offered to the escape of blood, and coagulation of the blood effused is promoted. Care must be taken that the plugging be not too forcible, otherwise uterine contraction and further separation may be excited by the irritation of the plug. The best methods of plugging the vagina are by introducing strips of lint, pieces of sponge, or a silk handkerchief, dipped in vinegar-and-water, or iced-water. Pieces of ice, wrapped in lint, may be introduced. There is a great advantage in the sponge-plug—namely, in its expansion from absorbing the blood, or the secretions of the vagina. But this is, to a great extent, counterbalanced by the rapidity with which sponge, from the animal matter it contains, becomes fœtid in the vagina. It cannot, on this account, be allowed to remain in the passage more than a few hours. It is, therefore, the best temporary plug, but it is not adapted to cases in which continuous plugging is required. As an ordinary plug, nothing excels in utility strips of lint, introduced one after another until the vagina is filled up. Even in plugging with lint, or a silk handkerchief, the plug requires to be changed from time to time, as whatever the plug, the retained blood and discharges, to which air is necessarily admitted, have a tendency to become rapidly fœtid. Whatever the treatment adopted in

placenta prævia one precaution should always be adopted—namely, to keep the patient in the horizontal position, with the pelvis somewhat raised. The temperature of the room should be cool and equable, and the diet light and unstimulating, except when the patient is suffering from the direct effects of loss of blood. Under these circumstances, brandy, ammonia, and beef-tea may be administered freely. I do not believe that in unavoidable hemorrhage, internal astringents, such as gallic acid or the acetate of lead, are of more than the slightest use, and they tend to divert the attention of the practitioner from more important measures. With this exception, the treatment of placenta prævia in the fifth or sixth month, when the os uteri is undilated, and the flooding not dangerous in extent, is hardly distinguishable from flooding in ordinary abortions. When hemorrhage has once occurred, the patient should be kept as quiet as possible, lest a further separation should be produced.

Puncturing the membranes and evacuating the liquor amnii in placenta prævia is a practice of very ancient date. It is occasionally useful, and is adapted for cases in which the hemorrhage is not of the most alarming character, where the os uteri is either closed or only dilated to a slight extent, where the pains of labour have already commenced, or where it is considered advisable to induce premature labour in this manner, where the liquor amnii is in large quantity, where turning is impossible, and where, the child being alive, it is judged best not to attempt the separation of the placenta. This operation is preferred in cases of partial attachment of the placenta over the os, where the membranes can be ruptured either by the finger, or a probe or trocar at the part free from placenta; but it has sometimes been performed with the effect of arresting the hemorrhage, through the placental mass, in cases of complete attachment over the os uteri. Puncturing the membranes in placenta prævia does not arrest flooding simply from diminishing the size of the uterus and exciting contraction, but by lessening its size and vascular supply, and bringing down the head or presenting part of the child, so as to act as a plug to the placental site. The disadvantages of puncturing the membranes are, that turning is thereby rendered difficult, and the risk of sacrificing the child is increased. In cases where the labour is premature, and the child non-viable, these objections do not apply at all; nor in cases where the child is dead, as craniotomy could then be performed. It is, however, questionable whether in these cases the extraction of the placenta should not be preferred.

In my opinion, turning is the great operation in placenta prævia, when the child is living and viable—that which, if performed at the proper time, affords the greatest chances of safety both to the mother and the child. But there are circumstances in which turning is the best practice when the safety of the mother alone is concerned, the child being already dead. The conditions favourable to turning are—a dilated or dilatable state of the os uteri, the retention of the liquor

amnii or a moderately relaxed state of the uterus, a pelvis of average capacity, the absence of dangerous exhaustion, or a temporary cessation of the hemorrhage. If the placenta be attached to one side of the uterus, the hand should be introduced on the side opposite to the placental site; or if it extends over the whole os, the hand should be passed in the direction in which the attachment is least considerable, or when the separation has already taken place. The advantages of turning are, that without materially increasing the danger of the patient, and in a very short space of time, the feet and body of the child may be brought down so as to act as a tolerably efficient plug to the os and cervix uteri. During the early part of the operation, the hand and arm of the accoucheur form a tampon. Turning is generally easy in placenta prævia, at the full term, as compared in other cases in which it is required, because the contractions of the uterus are commonly less powerful than usual. The flooding itself tends to dilate the os uteri, and to weaken uterine action. It is, therefore, a less severe operation to the mother than in many other cases in which it is called for. This is particularly the case in multiparous women. As regards the state of the uterus, primiparous women, as in other cases requiring turning, offer greater difficulties than women who have borne children. When the operation of turning is performed early, the proportion of mothers saved is large, and a considerable number of children are born alive. Turning should always be performed in placenta prævia, when it is considered advisable, the instant the operation is rendered practicable by the condition of the os and cervix uteri. In cases where the os uteri has been dilated for many hours, sufficiently to admit of turning, and blood or strength has been lost in the interim, we should blame, not the operation, but the delay, for a great proportion of the fatality to the mother and child. In some cases of partial placental presentation, the head may be so low that the use of the forceps will be preferable to turning; or this operation may become necessary after the spontaneous or artificial expulsion of the placenta. In other cases, as when the head is low, and the child dead, or when the pelvis is deformed, craniotomy may be called for. Dr. Radford has advised the use of electricity, in connection with the other methods of treatment, in these cases.

I have now to refer to the artificial extraction of the placenta before the birth of the child, which has certainly been one of the most prominent points in obstetric practice during the last ten or twelve years. It is one the settlement of which is of great interest, as nothing can be more unsafe than halting between two opinions upon such a subject. From an early period, it had been remarked by accoucheurs that cases of unavoidable hemorrhage were occasionally met with, in which the placenta was expelled spontaneously before the birth of the child, and that the hemorrhage was arrested by the separation of the placenta. The first person who seemed to have pointed out the deduction of a rule of practice from such cases was

Mr. Chapman, of Ampthill. The placenta was removed, in some cases of placenta prævia, by Mr. Kinder Wood, of Manchester, and subsequently by Dr. Radford. Probably cases have always occurred in which accoucheurs, finding the placenta loose in the vagina, or almost entirely detached, have removed it. Dr. Simpson took up the subject in 1844, and, with his usual ability and force, pointed out what he considers the advantages of this operation, the principles upon which it is founded, and the cases to which it is applicable. The tenour of Dr. Simpson's earlier writings was such as to lead to the belief that he wished to supersede in great measure the operation of turning, by the separation and extraction of the placenta. This impression has continued to a great extent up to the present time, and it is upon this impression chiefly that its opponents have attacked and denounced the operation. In one of his latest publications on the subject, in the 'Lancet,' 1847, vol. i., he has corrected this, and insists upon the limitation of the extraction of the placenta to cases "when the other recognised modes of management were insufficient or unsafe, or altogether impossible of application," or when the old methods of practice "were attended by extreme hazard or extreme difficulty." Dr. Simpson combined with his advocacy of this practice an exposition of his views as to the source of the hemorrhage in placenta prævia, which met with great opposition. Dr. Hamilton advocated the doctrine that the hemorrhage in placenta prævia "proceeds from the separated portion of the placenta more than from the ruptured uterine vessels." Dr. Simpson endorses this view to the full extent, and I suspect it is this, as much as the rule of practice itself, which has excited the opposition which has been manifested. According to this hypothesis, the blood lost in separation of the placenta flows from the placental cells, the supply to these cells being kept up by vessels supplying the undetached portion of placenta. It is supposed that as the separation proceeds, the veins of the uterine surface from which the placenta is detached, are closed so as to prevent any retrogressive hemorrhage from the uterus.

Dr. Simpson's theory of the source of the hemorrhage, upon which he to some extent rests his practice of separating the placenta is, I believe, altogether untenable. No proofs of the escape of the great quantities of blood lost in these cases, from the placental surface, can be given. The theory mainly rests upon the anatomical arrangement of the uterine arteries, the placental cells, and the openings upon the placental surface. No doubt there is an unobstructed channel for the flow of blood from the curling arteries, through the placental cells and the openings found upon the placental surface, when this has been separated from the uterus. But there are, as it appears to me, valid reasons why we should believe that the sudden and great gushes of blood poured out in placenta prævia do not escape in this way. The uterine arteries are of comparatively small calibre, and the openings upon the placental surface are neither large nor numerous. Supposing

one-half of the placenta to be detached, it is highly improbable, I should almost say impossible, that the profuse loss frequently met with in these cases could come from the uterine arteries entering the undetached portion of the placenta, even if they were all discharging blood simultaneously. In the cases of profuse loss which sometimes occur, when only a small portion of the placenta is detached, it is equally difficult to suppose that the blood could escape from the openings met with on a square inch of placental surface. There are, on the other hand, valid reasons for believing that the uterine veins are the real sources of hemorrhage in placenta prævia. The size of the venous openings, the valveless state of the uterine veins, the channel being unimpeded from the right auricle to the open mouths of the sinuses, furnish anatomical arguments in favour of this source for the flow of blood which are stronger than those derived from the anatomical arrangement of the uterine arteries, and the placental sinuses, in favour of the opposite view. Then we have the facts connected with post-partum hemorrhages. The only hemorrhages comparable for suddenness and extent to the losses in placentia prævia are those which occur after labour, and the expulsion of the placenta, in cases where it has been attached at the fundus uteri. Here there can be no question but that the hemorrhage takes place from the open mouths of the uterine veins. I have not observed any difference in the colour or character of the blood in post-partum hemorrhages and those caused by placental presentation, and the weight of evidence is in favour of the venous character of the blood lost in placenta prævia. It is noticed that in this form of flooding the loss is increased during the pains, as it is believed, by the enlargement of the uterine openings by the dilatation of the os and cervix uteri, whereas, in hemorrhage from the fundus, the flow of blood is arrested during the continuance of pain and contraction. When the separated portions of placenta have been examined, it has been found that the sinuses and cells have been filled with coagulated blood. In some cases, in which the placenta has been detached and expelled artificially or spontaneously, flooding has occurred after the expulsion of the placenta. Here the blood must have been in great part from the uterine veins, yet the flooding presents no difference to that occurring from the partial separation of the placenta. The inference from all these facts appears to be, that in the hemorrhage from placenta prævia the blood escapes in great part from the uterine surface, and not from the maternal surface of the placenta. There can be little doubt that some blood must exude from the surface of the placenta in cases of partial separation, whether the placenta be attached to the fundus or cervix ; but I contend that this is not the chief source of flooding in placenta prævia.

While I thus take exception to Dr. Simpson's theory of the nature of hemorrhage in placenta prævia, I do not question the correctness of the fact upon which he lays so much stress—namely, the frequent, and indeed common, arrest of the hemorrhage on the entire detachment of

the placenta. Dr. Simpson's theory does not appear to me to be necessary to the explanation of this matter. In my work "On Parturition," I pointed out that the separation of the placenta furnishes a source of irritation which excites the uterus generally, and the muscular structure at the site of the placenta especially, to contraction, and that in this way hemorrhage was prevented. This is probably the reason why, in twins with separate placentæ, there is frequently no hemorrhage between the expulsion of the first placenta and the birth of the second child. It is reasonable to suppose that the same thing occurs in placenta prævia, after the separation and extraction of the placenta, in the intervals which occur between the pains. The tendency to hemorrhage from dilatation of the orifices of the veins during the pains is corrected by the descent of the head or presenting part, and mechanical compression of the uterine walls.

Dr. Simpson unequivocally demonstrates that in a great number of cases recorded by various authors, both before and since the publication of his views, the placenta has been detached and the hemorrhage arrested. There can, indeed, be no question upon this point. Those most opposed to Dr. Simpson, Dr. Robert Lee, for instance, record cases in which the hemorrhage ceased after the spontaneous expulsion of the placenta. The cases to which, in his most recent writings, Dr. Simpson would advise separation and extraction are those in which the evacuation of the liquor amnii is of no avail, when the state of the patient is such as to call for interference, but where turning, or other measures of delivery, are impracticable, from rigidity, or non-development of the os and cervix uteri, or distortion of the pelvis. He would also employ it in the case of dead, premature, or non-viable children, particularly when the uterus has contracted, or is so imperfectly developed as not to admit of turning. It is questionable if rigidity can be a valid plea for this operation, except in very rare cases. When the os uteri is sufficiently open to allow of the admission of the fingers for the purpose of separating the entire placenta, there will generally be room enough for the admission of the hand. I believe the separation and extraction of the entire placenta the best practice in those cases in which it is attached all round the os uteri, and in which the exhaustion is so great as to render some more rapid attempt at assistance than the operation of turning imperative. In some of these cases the patients would be killed by turning, if the hemorrhage were going on simultaneously with the operation.

The extraction of the placenta offers a means of arresting hemorrhage, and after a short rest the patient may be sufficiently rallied to bear turning: for it must be remembered that in many of the cases in which the placenta has been extracted artificially, turning has been necessary to complete the delivery. In all cases where the child is alive and viable, delivery should be effected, by turning or the forceps, as soon as possible after the extraction of the placenta, if the state of the patient is such as to bear the operation. Extraction may be some-

times useful in cases where turning is impossible, as in cases of contraction of the uterus or pelvic deformity, and when the removal of the placenta may arrest hemorrhage and facilitate the operations of turning, craniotomy, or evisceration. It may also be practised in some cases of dead or premature children, when the hemorrhage is going on, and turning is difficult from any cause. When the flooding is not profuse, and when the uterus is roomy and the waters undischarged, the extraction of the placenta before the child offers no great advantage. The whole subject has been ably handled by Dr. Chowne, and Dr. Fleetwood Churchill gives a very candid exposition of the disadvantages of the operation.

It is necessary to refer to the statistical arguments which have been advanced in favour of the operation. Dr. Simpson has given a table of 654 cases, collated from various authors, from Mauriceau to the present day, in which the treatment consisted of turning, &c., the child being extracted before the placenta. This he contrasts with another table of 141 cases, in which the placenta was removed or expelled before the child. In the 654 cases, 180 mothers, or one in three six-tenths, were lost. In the 141 cases, the maternal mortality was 10, or only one in 14, which apparently gives a very large balance in favour of the extraction of the placenta before the child. But it has been argued by Dr. Barnes that we cannot fairly suppose cases in which the placenta is extracted artificially will prove as favourable as those in which it has been detached and expelled without assistance. The cases in which the placenta is expelled by the natural efforts are those in which the pains are powerful, the placenta being expelled suddenly and the child speedily born. In the case of artificial detachment and extraction, no assistance from the uterus can be reckoned on. The difference is very great between the spontaneous separation and expulsion and the artificial detachment and extraction of the placenta. The published cases of extraction of the placenta are too few to found upon them any precise conclusions: and it must also be remembered that the advocates of any novel mode of practice are more prone to publish successful than unsuccessful cases. The statistics of Dr. Radford, of cases in which the placenta was removed by the hand, are not so favourable as regards the mother, as those of Dr. Simpson.

By the ordinary methods of practice, rather more than half the children are lost; and Dr. Simpson attempts to show that the mortality is scarcely more than this when the placenta was extracted before the child. He gives a table of 141 cases: of these the child was saved in 33 cases; in 79 cases it was born dead; in 1 the child was anencephalous, and died shortly after birth; in 28 cases, the result, as regards the child, was not stated. But such a state of mortality cannot be hoped for from artificial extraction. In many of the cases of spontaneous expulsion, the fœtus, membranes, and placenta are expelled by the same pain. Dr. Simpson, as Dr. Fleetwood Churchill observes, has only recorded one case of the child being born alive when the in-

terval after the removal of the placenta was more than ten minutes. Dr. West collected 17 cases; but in 16 of them the children were lost. If this frightful rate of fœtal mortality should be preserved, it must go far to prevent the adoption of extraction in any but the most unpromising cases.

In 1847, Dr. Barnes enunciated the principle, that a partial separation of the placenta might, in certain cases, be sufficient to arrest the hemorrhage, and at the same time afford a chance of safety to the child. In a recent paper on this important subject, an abstract of which was published in 'The Lancet' in January last, Dr. Barnes recommends a partial detachment of the placenta in cases where it is partially attached to the cervix, or where it is implanted in its whole circumference. His method is to detach that portion of the placenta attached to the cervix, after which he believes that no further separation is produced by the uterine pains, and the hemorrhage entirely ceases. The portion of the placenta attached above the cervix is left, and remains as a medium for the supply of the fœtus. Dr. Barnes has collected a large amount of clinical fact and experience bearing upon this subject, and it is to be desired that he should publish his views *in extenso*, with the practical results. Nothing could be more valuable than the establishment of a mode of practice which should diminish the danger to the mother, and increase the chance of safety to the child. In Germany, several physicians have done Dr. Barnes the honour to claim and contend for originality in advancing the doctrine of the partial separation of the placenta; but there can be no doubt the principle was clearly expressed by him nearly ten years ago.—*Lancet, August* 2, 1856, *p.* 121.

108.—TWO CASES ILLUSTRATING THE ADVANTAGES OF TURNING AS A SUBSTITUTE FOR CRANIOTOMY.

By Dr. J. G. Wilson, Physician to the Glasgow Lying-in Hospital and Dispensary.

[We consider the two following cases exceedingly valuable as supporting Dr. Simpson's practice in similar cases. We have had one similar example in our own practice, and feel satisfied that the profession ought to adopt this mode of proceeding generally in such cases.]

Case 1.—July 17, 1855. Called to see Mrs. W., aged 42, resident in Calton, who, as I learned from the student in attendance, had been in labour for the greater portion of two consecutive days. The uterine action had been powerful and regular during the greater part of that period, but had gradually become weaker and more intermittent. The membranes had been ruptured, and the liquor amnii evacuated about 24 hours before my seeing her. On my arrival, I found the woman weak and exhausted, with a small and rapid pulse. Examination *per vaginam*, detected a considerable jutting forwards of the sacro-vertebral angle,

and which had the effect of materially diminishing the antero-posterior diameter of the pelvic brim. The greater bulk of the infant's head was still at the inlet of the pelvis, whilst a large scalpy tumour projected into the cavity, firmly embraced in front and behind by the pelvis. The os uteri seemed dilated to its full extent. This state of matters had continued for twelve hours—the only difference being that the tumour was slowly enlarging, whilst the patient's strength was becoming hourly more depressed, and the action of the fœtal heart fainter and weaker. Under these circumstances, it was evident that something must be done to relieve the patient, and that without delay. Three methods of operative procedure presented themselves for adoption, viz., long forceps, craniotomy, and turning or delivering by the feet. As considerable difficulty and danger was anticipated from the use of the long forceps, from the high position and altered form of the head, as well as from the contracted brim, the idea of having recourse to them was abandoned. The fact of the infant being still alive, as indicated and ascertained by the increasing swelling of the scalp, as well as by auscultation, was, in my estimation, an adequate reason for discarding the idea of craniotomy. Thinking that the case was in all respects one well adapted for testing the merits of the operation of turning in such cases, it was agreed to give the woman the chance of delivery by that method. After having administered a stimulant to the patient, I passed the left hand up through the vagina to within a short distance of the fundus uteri, where the feet were found, one of which was seized and brought down into the vagina. The breech, body, and arms were extracted with comparative facility, but considerable difficulty was encountered, and much exertion required, in the transit of the head. The child, when born, was in a semi-asphyxiated state, but the usual restorative means persevered in for a short while sufficed to bring it completely round. The uterine action being suspended, the placenta was extracted after a due interval. The patient bore the operation well, much better than under the circumstances could be reasonably expected, and when last visited, was progressing favourably. It should be mentioned, that six years before, she gave birth to a premature child. Having been subject, for a considerable period during the interval, to dull pains and uneasiness in the lumbo-sacral region, she expressed her belief that some contraction or malformation of the pelvis had thereby been induced.

Case 2.—This case I saw along with Drs. Gooldie and Yeaman, under whose kind and able care the patient was. The history of the case is briefly as follows :—

Mrs. R——, æt. about 30, dwelling at Anderston, was seized with labour pains on the afternoon of Wednesday, October 24, 1855. The pains being strong, and recurring at regular intervals, Dr. Gooldie remained with her all night. At six, a.m., of the following day (Thursday), the liquor amnii was discharged, a loop of the

cord, pulsating strongly, became prolapsed, but was, without much difficulty replaced. The pains continued of a violent and bearing down description during the day, without, however, materially advancing the head. Dr. Gooldie being of opinion that there existed some degree of narrowness or contraction of the pelvis in its conjugate diameter, and thinking that operative interference would be required to effect delivery, requested me to see her about midnight. I found the os uteri fully dilated. The greater part of the child's head appeared to be still at the superior strait of the pelvis, with a large scalpy tumour protruding into the cavity. Although the narrowness of the pelvic brim was not so decided, or so well marked as in the previous case, still there can be no doubt but that contraction existed to some extent. In consequence of the swelling of the head obliterating all trace of the sutures, it became impossible to tell, with any degree of certainty, the exact position in which it presented. The stethoscope showed that the child was still in life. The patient having been by this time upwards of thirty hours in labour, was getting exhausted, and becoming fretful and impatient, and extremely anxious that something should be done for her without any further delay. The pulse was 120, skin feverish, vagina hot and dry.

For reasons similar to those mentioned in the foregoing case, it was agreed to have recourse to podalic version, and I was requested to undertake the operation. After the patient was put thoroughly under the influence of chloroform, the left hand was introduced into the uterus, the right knee was seized, and the foot brought into the vagina. After the extraction of the body, the head remained fixed high up, with the chin resting upon the promontory of the sacrum, and the occiput overlying the pubes. After considerable exertion, and the use of much extractile force, the head was brought into the cavity of the pelvis, through its right oblique or diagonal diameter, a couple of fingers introduced into the mouth, aided by traction in the direction of the axis of the pelvic outlet, sufficed to complete the delivery. The forceps were in readiness, in the event of manual extraction of the head not being sufficient, but were not required. The child, a full-grown male, when born was in a state of asphyxia, but by the persevering use of the ordinary resuscitative means, it was at length restored. The mother made an excellent recovery. The child survived its birth seventy four hours, and its death was ascribed by Dr. Gooldie to inflammation and suppuration of the integuments of the scalp, undoubtedly induced by the protracted pressure before delivery. This affection of the scalp was best marked and most distinct over the posterior and superior quarter of right parietal bone. Soon after the operation, Mrs. R. again became pregnant. Fearing lest a repetition of the operation would not be attended with such a favourable result to the patient, the membranes were punctured, with a view to induce premature delivery, on the forenoon of Friday, the 5th September, 1856—she having then arrived at about the eighth month of

utero-gestation. It was regretted at the time that the operation had not been performed at an earlier period, but circumstances did not admit of it. Labour pains supervened in a couple of hours after the rupture of the membranes, which increased in intensity till half-past ten, p.m., when the child was born. It is worthy of remark, that the infant was a *female, smaller than ordinary at the eighth month*, and that it presented with the *breech*. Mother made a good recovery.—*Edinburgh Medical Journal, Oct.*, 1856, *p.* 308.

109.—*Case of Turning as a Substitute for Craniotomy.* By Dr. J. M. WINN, Senior Physician to the Metropolitan Dispensary.—The following case proves that this method may sometimes be safely and advantageously employed :—Mrs. M——, a well-grown and healthy woman, having a narrow but not deformed pelvis, was seized with strong labour on the 23rd of July last. After twelve hours of severe and incessant pains, the head, which presented, lay completely above the brim of the pelvis; the os uteri had become swollen, and had not expanded beyond the circumference of a crown-piece. Under these circumstances, as her strength was beginning to flag, I gradually dilated the os uteri, and having introduced my hand into the uterus, I turned the child and extracted it without much difficulty. The infant, a girl, was slightly asphyxiated at birth, but is now alive and in good health.

Although in this and similar cases, turning may be advantageously had recourse to, it must not be forgotten that when the pelvis is greatly deformed the following reasons are opposed to its adoption :— 1. The powerful traction required might separate the neck from the trunk of the child. 2. If the head be too large to pass after the shoulders are born, craniotomy must be performed at a disadvantage, and nothing is gained. 3. The pressure on the funis during the inevitably protracted delivery by turning, in a narrow pelvis, must be equally fatal to the child as craniotomy. It must also be understood that version ought not to be practised in the event of the child being dead, as the operation for craniotomy is, for the most part, attended with less inconvenience to the mother, and does not harass her so much as the operation of turning.

In the above case, there were a few points in the previous history of the woman's two preceding labours which determined the proper course to be pursued. The points I refer to were briefly these :—In her first confinement craniotomy had to be performed, after an ineffectual effort to deliver by the forceps. In her second confinement she was delivered of a living child, after a severe and protracted labour. No one remedy is suitable for every variety of difficult labour dependent on insufficient pelvic room. The success of an accoucheur is owing to the skill and decision with which he wields the various resources that science and art have placed at his disposal. His duty

is to adopt the right means at the proper time, without reference to the dogmata of any particular school of midwifery, and irrespective of any theory, however ingenious or plausible.—*Lancet, August* 9, 1856, *p.* 161.

110.—ON POST-PARTUM HEMORRHAGE.

By Dr. W. Tyler Smith, Physician Accoucheur to St. Mary's Hospital.

The first point in the management of post-partum hemorrhage relates to its prevention. Where there have been any circumstances connected with the labour, which leads us to fear hemorrhage, one or two doses of ergot should be given during the last pains which expel the child, or immediately after its expulsion, and before the extraction of the placenta. This plan should always be followed in cases where women have suffered from flooding in several successive labours. Immediately after delivery in suspicious cases, the hand should be placed upon the abdomen, and kept there until efficient contraction is felt to have taken place. An abdominal bandage should be placed lightly round the body, before the completion of labour, so as to have it ready if necessary without disturbing the patient. The horizontal position should of course be strictly preserved. Sleep, immediately after labour, should not be permitted, and the vulva should from time to time be examined, to learn the amount of discharge. As soon as the uterus is found to have contracted, the abdominal bandage, with a compress of two or three folded napkins, should be applied. I have known cases where I have been obliged to attribute a fatal result from hemorrhage to the neglect of bandaging after delivery.

In the treatment of post-partum floodings, we have two things requiring instant attention, one being the arrest of hemorrhage by uterine contraction—the other, the sustentation of the patient under the immediate effects of loss of blood. As I have pointed out in my work on Parturition, we have a good many powers to appeal to for inducing uterine contraction. There is the reflex contraction of the uterus, as when we dash cold water upon the vulva or abdomen. There is the direct spinal excitation of the uterus, when we act not upon the excitor nerves of the surface of the body, but upon the spinal marrow itself—as when we give ergot. There is the peristaltic action of the uterus and the contraction depending on muscular irritability of the uterus itself, which we call into operation when we manipulate the uterus, or excite it by galvanism. We can also imitate contraction of the uterus, to some extent, by mechanical compression; and we can exert pressure upon the great vessels through which the blood is poured into the uterus before its escape from this organ.

In practice, and in the worst cases, the uterus should be grasped and held firmly by the hands, through the abdominal parietes. This

excites the peristaltic and reflex action of the uterus, and compresses the organ mechanically. When the uterus is got well under control in this manner, flooding to any great extent is impossible. Several doses of the ergot should be administered in quick succession, and cold—or, if in summer, iced—water should be dashed upon the vulva and abdomen. Douching with a wet towel, or a stream of water from a height, upon these parts, is very effectual in rousing the uterus to contraction. The time during which it is necessary to grasp the uterus is often very considerable. When these means fail of entirely arresting the hemorrhage, the hand should be introduced into the uterus, and the internal surface excited by the knuckles of the closed hand. I have not the same dread as many accoucheurs have of introducing the hand into the uterus, and, as I have once or twice insisted on in these lectures, I believe, in the present day, more mischief is caused from a kind of fear of the uterus, and of interfering with it, than from bold and intelligent efforts to control it. The hand should always, if possible, be washed before its introduction. With the hand in the uterus, it becomes more easy to grasp and compress the organ. As an addition to the introduction of the hand, where the uterus is felt to be in a state of atony or paralysis, I have injected cold or iced water, in a full stream, into the cavity of the organ, and in this way I have several times rescued women from an apparently hopeless condition. I have had no experience of the effects of galvanism in post-partum flooding, but where there was time to bring it into operation, I should have no doubt of its power. With respect to the modes of using reflex action for the arrest of hemorrhage, it should be mentioned that cold and heat, alternately, are more efficacious than cold continuously used, even when we inject into the uterus itself. It should also be borne in mind that cold is a powerfully depressing agent, and should not be used to such an extent as to weaken the patient. When one reflex surface is exhausted, we may often appeal to another with great effect. Thus, when cold to the vulva and abdomen has been used so long as to lose its effect, cold sprinkled on the face, swallowing a gulp of cold water, giving a patient a piece of ice to hold in her hands, an enema to the rectum, will excite reflex uterine contraction. Whenever coagula collect in the vagina or in the uterus, they should be turned out by the hand. Clots are a source of great irritation, and their presence tends to keep up hemorrhage. Their removal alone will often suddenly relieve the patient of severe spasmodic pain, and stop all loss of blood. In cases of hemorrhage, where the placenta is only partially separated, or where it is detached from the uterus, but retained in its cavity, the placenta should always be separated and removed, as early as possible. Some practitioners have recommended, under such circumstances, that we should wait a little when the patient is much exhausted before removing the placenta, on the ground that the operation itself, and the removal of the mass of the placenta, tend to produce fatal syncope. We may wait

an instant, while we pour some brandy down the patient's throat, but I have seen much mischief from delay beyond this, and never any harm from immediate action. We can make up for the removal of mere mass by external pressure, and every inch by which we reduce the size of the womb increases the patient's safety. Pressure upon the aorta and inferior cava has been recommended by many authors. In extreme cases, transfusion has been advised, and, when other means fail, I should have no hesitation in recommending and performing it. Some time ago, a lady was under my care in whom transfusion was performed successfully by Mr. Soden, of Bath, and, from the nature of the case. I have no hesitation in stating my belief that the operation saved her life. This measure seems particularly suited to cases in which patients are slowly dying, by the process of syncope, some hours after hemorrhage has ceased.

During the continuance of uterine hemorrhage of any kind, no stimulus is so useful as brandy. In post-partum floodings especially, immense quantities may be taken with the utmost benefit. It is a misfortune that in some cases there is such an amount of gastric irritability that all stimulus and support is rejected by vomiting. This sometimes happens in hysterical subjects, the hysterical element persisting even in the act of death itself. In such cases, small quantities of brandy or beef-tea should be given. The patient should be kept with the pelvis raised and the head depressed, the object being to retard flooding, and supply the circulation of the brain. I have found from experience, that less tendency to syncope is present when the patient lies on her left side than in other positions. Fresh air should be supplied, as by fanning and open windows, and the patient kept with as little movement of the limbs as possible. After the cessation of hemorrhage, when the effects have been severe, the patient should not be moved at all for some hours after labour, and she should not be allowed to stand, or to sit up during defecation or micturition, for many days, or even two or three weeks, after labour. Many patients have died suddenly from exertion of this kind, taken before they had sufficiently recovered from the loss of blood. When patients have been very much reduced by hemorrhage, considerable discretion is called for in the introduction of food and support into the system. We must not, on the other hand, push too much nourishment rapidly, otherwise we distend the weakened vessels, and may incur the risk of apoplexy; or, on the other hand, starve the patient, or we perpetuate the state of anæmia.

There is an after-train of symptoms arising from loss of blood, consisting of reaction, particularly affecting the heart and brain, which to some extent imitates active disease. There is violent palpitation, acute pain in the head, violent throbbing of the carotids, and intolerance of light and sound. Great care must be taken not to treat such symptoms by local or general blood-letting, as has sometimes happened. A good diet, stimulants, steel and tonics, are required in such cases.—*Lancet, September* 27, 1856, *p.* 362.

111.—CASE OF ABORTION, WITH FLOODING.—NEW PLUG.

By W. F. Cleveland, Esq.

[Mrs. D., two months pregnant, was attacked with labour pains two days before she was seen by her medical attendant; these were followed by a profuse discharge of liquid blood and coagula. This had continued without abatement, although cloths wet with vinegar and water had been applied. Cold water injected into the rectum and other means had been tried.]

On examination *per vaginam*, the os uteri was patulous, cervix dilated. A portion of the ovum, entangled in firm coriulum, and protruding from the os, was removed; but it was evident, from the size of the uterus, something still remained. As blood was escaping freely, and there was no probability of the rest of the ovum being then expelled or removed, it was determined to plug the vagina. After evacuating the bladder, and applying a bandage and compress to the abdomen, I introduced a No. 2 ball into the upper part of the vagina, and injected water, previously made as cold as exposure for some time in a cold atmosphere would make it. The introduction of the instrument occupied but a few moments. The patient felt the sensation of cold a little, as also that of distension; but it soon passed off. After waiting a quarter of an hour, and finding there was no escape of blood, she was left for the night, and directed to take a fourth part of the following mixture every three hours.

℞. Acidi gallic. ʒj; acidi sulph. dil. ♏ xl; tincturæ opiii ʒss; syrupi ℥ss; aquæ cinnamoni ℥ vss. M. Fiat mistura.

It should be stated that, at the time it was decided to use the plug, the patient was in bed, and much exhausted from the hemorrhage, which had been going on for more than forty-eight hours. In attempting to raise herself in bed, she had fainted. The face was blanched; pulse small, and very quick.

Feb. 22nd. She has had some sleep, and there has been no hemorrhage. There is no appearance of any blood whatever having escaped. The plug was now removed with the greatest ease; it had been *in situ* twelve hours. There was a small coagulum at the top of the ball. A sanious and fœtid discharge followed on her passing water, and moving in bed to have her linen changed. The patient states that she passed water twice during the night without the least inconvenience from the instrument; and indeed she could not have been aware of its presence from any sensation produced by it. She has taken wine and nourishment and has considerably rallied. Little or no progress was made towards the expulsion of the ovum.

On the following day, there was a return of the hemorrhage, although in a minor degree. She was ordered a dose of castor oil; and as this did not act, she took some sulphate of magnesia, which moved the bowels several times; while pain in the back was at the same time in-

duced. Several attempts were made to seize and extract the ovum with a pair of long forceps; but, owing to so small a portion of it being extruded, and that exceedingly lacerable, they were given up. She now took several doses of the etherial tincture of ergot; and not until three days more had elapsed, or eight from the commencement of the abortion, was the rest of the ovum expelled. A fœtid discharge continued for several days, and then gradually ceased. She has been slowly recovering her strength.

Remarks. The principle on which the instrument above alluded to is constructed is as follows:—A common vulcanised India-rubber air-ball, sold at the shops as a child's toy, and numbered according to size (a No. 2 being the size of a large orange, and applicable before the vagina has been greatly distended, as in the recent passage of a fully developed fœtus), is fastened to one end of a thin incorrodible metallic pipe, six inches long. At the other end of the pipe is a stopcock, with shoulder fitted to receive the nozzle of a large syringe. The air is to be pressed out of the ball, and kept excluded by turning the tap, when it (the ball) may be folded into a small and compact mass, and introduced into the upper part of the vagina. The syringe is now to be applied, the tap turned, and ice-cold water, or a freezing mixture, injected into the ball until it is distended to a sufficient size, when the tap may be again turned, and the syringe removed. A double tube is adapted to one of these balls in my possession (a No. 4,) by which a continuous stream of cold water may be maintained through the ball without affecting its volume.

The opportunity that has occurred of putting this instrument to a practical test has only confirmed the opinions I have ventured to advance in regard to its efficiency as a plug, its easy introduction and removal, the advantages of non-absorption, cleanliness, and comfort, to the patient; while the facility with which cold may be applied by it in immediate proximity to the uterus, or source of hemorrhage, must be considered a desideratum.—*Association Med. Journal, March* 22, 1856, *p.* 234.

112.—CASE OF PUERPERAL CONVULSIONS.

By Dr. R. T. Woodhouse, Physician to the Royal Berkshire Hospital.

[Mrs. H. M., aged 37, of sanguineo-nervous temperament, has had eight living children in thirteen years, and has always recovered well. Between the birth of the sixth and seventh child, she was subject to severe hysterical paroxysms. On April 27th, 1854, after one hour's labour, she was safely delivered; the bandage was adjusted, and two drops of laudanum given in two teaspoonfuls of brandy and water. As the labour had taken place a fortnight earlier than was expected, the nurse which she had engaged could not attend to her. This disappointment produced considerable excitement, and prevented her sleeping.]

April 28th. 3 A.M., just twenty-four hours after her delivery, she requested the nurse (a stranger to her, who was obtained for the emergency) to give her a bason of chocolate and with it the Bath bun. She then dismissed the nurse to an adjoining room, and said she would call her if she wanted her; she would try to compose herself to sleep, as she had not had any all day. She complained also of headache. Soon after this, her husband, who lay on a small bed in the room with her, was roused by some peculiar noise, and on looking at her, found she was in violent convulsions, every feature being contorted, and the countenance almost black. He called the nurse, and desired her to go for me and for Mr. May, saying that her mistress was dying. He, either overcome by his feelings, or alarm at the appalling sight, fainted and fell on the floor.

About ten minutes or a quarter past four, I was roused by a loud ring at my bell, and a hurried breathless message left that I would go immediately to Mrs. M. On my arrival at the house I was admitted by the nurse, who begged me to proceed up stairs at once, as her mistress was dying.

On entering the room I found the patient with a purple countenance, sibilant breathing, and all the phenomena of a convulsive fit, which terminated in a few minutes. The husband soon returned, followed by Mr. Harrinson. When the struggle ceased, the face became pale; the pulse quiet; no stertor. There was bloody froth about the lips. Pupils active; the bowels had been moved two or three times during the preceding day. The epigastrium was enormously distended, and tympanitic, while the lower part of the abdomen was loose and flat. She had passed water freely, as before mentioned. There had not been any œdema of the face or extremities, or any other reason to suspect uræmia. Neither had there been hemorrhage or other exhausting cause. We could find no other source from whence these symptoms could arise than the irritation of the stomach from the chocolate and Bath bun. On the supervention of a second convulsion, we determined, if possible, to empty the stomach, and with this view gave her one scruple of sulphate of zinc in an ounce of water, which I passed down to the pharynx by teaspoonfuls, while Mr. Harrinson forcibly separated the jaws by the handle of a toothbrush; this, in due time, failing to produce the desired effect, Mr. Harrinson tried to excite vomiting by passing his finger, and afterwards a feather, into the fauces, both of which also failed. We then gave her half a drachm of ipecacuanha with another scruple of zinc, but without success, not even provoking retching. As we could not succeed in bringing it up, we determined to try and drive it downwards, and accordingly gave her ten grains of calomel by placing it on the tongue and washing it down with a draft of compound senna mixture, with three drachms of Epsom salts; and an enema of castor oil and turpentine, of each an ounce, in a pint of gruel, were thrown up. Twelve leeches were applied to the temples;

cold lotion to the forehead; hot bottles to the feet and sinapisms to the legs. A blister had been already applied to the nape of the neck by the husband. The fits continued to recur every half hour, and no signs of returning consciousness had yet been exhibited.

About seven o'clock we determined to wait the effect of these means, and to meet again in two hours. We had not reached home when we were summoned back with the message that another frightful fit had come on. Convulsion followed convulsion with increased severity, in quick succession; the interval was diminished; the cheeks more relapsed, and flapped more audibly and freely, with the heaving respiration. The tongue was severely bitten; each successive fit told fearfully in every way; and it was manifest (I use the words of Mr. Harrinson) "that if relief was not obtained in some way, and that speedily, her destruction was not threatened, but imminent." None of her medicines had taken effect.

At this juncture it occurred to me to suggest the employment of turpentine by the mouth, from its warm stimulating, as well as its aperient power; and to assist the latter quality, castor oil was added, with a little syrup, and was passed over the tongue by a teaspoonful at a time, as the former draughts had been. This had a most marked effect; the first teaspoonful had scarcely been swallowed, when the machinery of relief was set in motion, as Mr. Harrinson expressed it; the bowels were copiously relaxed, volumes of flatus were disengaged and expelled, her face brightened up, and her consciousness so far returned as to offer resistance to the remainder of her potion. She had no convulsion from this time. At nine o'clock, after four hours anxious attendance, we left the house to meet again at half-past ten, a.m. We found there had not been any return of convulsion, and she seemed disposed to be quiet.

At half-past two, p.m., I found her more conscious, but still unable to speak. The bowels had been moved twice—once involuntarily, and once she called out for the bed-pan. Beef-tea was ordered.

Half-past seven, p.m. She is still comfortable. To have a mixture of bicarbonate of potash, mucilage, and liquor opii sedativus, if the bowels are irritable.

April 29th. Half-past ten, a.m. She has had a good night; is quite conscious; complains of sight being confused; no pain; bowels moved four or five times; stools black. I ordered a mixture of carbonate of potash, mucilage, and liquor opii, in cinnamon water; beef-tea, arrow-root, sago, &c. The milk began to be secreted. The lochia were scanty, yet all seemed to be going on well.

In the evening I found she had been rather rambling in her conversation during the day, and complained of seeing ugly faces on the bed furniture, and strange figures in the room. A draught composed

of extract of hyoscyamus and liquor opii sedativus in camphor mixture, and quiet, were ordered.

April 30th. She has had a bad night; no sleep; talking incoherently; fancying she saw strange things, and that her mother, nurse, and husband were evil spirits, with other threatenings of delirium tremens, probably arising from exhaustion, or a state of anæmia, requiring quiet and stimuli. Bowels moved three or four times; motions bilious, and natural in colour. To have beef-tea *ad libitum*, and a teaspoonful of brandy in water every three hours, and a draught containing fifteen drops of chloric ether every six hours.

Under this treatment the cerebral functions were gradually restored, and with a cautiously augmented nutritious diet she ultimately got quite well, and continues to nurse her infant with sufficiency and ease. The legs were severely vesicated by the sinapisms, and were troublesome to her for several days.

As to the share which the turpentine given by the mouth had in effecting the desired relief, I am not sure that we are to ascribe the whole of the merit to it alone. It certainly appeared to act instantaneously, but it is not improbable that the calomel and black draught and the enema may have acted as pioneers to it. At the time, it certainly responded to the train of reasoning in my mind which prompted its suggestion; namely, its cordial, stimulating, and astringent operations on the mucous surfaces. I had often seen it employed in the wards of the Dublin Lying-in-Hospital, in cases of flatulent distension of the bowels, where it was in my day an established remedy; but in this instance its use was not prompted, though supported by past experience.

A late writer in the 'Association Journal' recommends the internal use of spirit of turpentine by the mouth, with something of the air of novelty about it; but I believe its introduction to obstetricians, as a remedy for puerperal disease, is due to Dr. Brennan, of Dublin, who wrote a pamphlet on the subject about the beginning of the present century.

The relief obtained at once by the removal of the irritating cause rendered the employment of all other remedial means unnecessary. Opium, antispasmodics, and chloroform are in certain cases valuable adjuvants; but here they were not required, and would have been useless until the exciting cause was removed.

The after treatment of the case requires little comment. The mixtures containing the bicarbonate of potass and liquor opii were intended to soothe and allay the irritation of the bowels after such irritating purgatives; and the slight delirium which arose on the third day, from exhaustion, yielded to a more generous diet and the slight stimulus of brandy and chloric ether.—*Association Medical Journal, May* 17 1856, *p.* 406.

113.—ON THE TREATMENT OF UTERINE DEVIATIONS.

By Dr. E. J. Tilt, Senior Physician to the Farringdon General Dispensary and Lying-in Charity.

[The importance which Dr. Tilt attaches to the relaxed state of the vagina in the mechanism of retroversion and anteversion, explains the importance which he attaches to the treatment which may correct this state.]

Astringent injections carefully made, either with Coxeter's syphon-syringe, or with Mr. Whitehead's prolapsus tube, the changes being rung on strong solutions of alum, sulphate of zinc, or tannin. The action of such remedies should be maintained by placing pledgets of cotton-wool, soaked in one of these solutions, high up in the vagina, removing these applications several times in the course of the day. There is another mode of applying astringents, which I consider even better than the above. I enclose in cotton-wool a little lump of alum or acetate of lead, about the size of a hazel-nut, and I tie round it a piece of string long enough for the ends to hang out of the pudenda, then the alum ball is placed as high as possible in the vagina, which may be done without using the speculum. The cotton-wool imbibes the vaginal fluids, and they dissolve the alum by degrees, which thus acts strongly for a long time on the walls of the vagina. So great is the astringent action, that it may become difficult to pass the finger through the vagina so as to reach the neck of the womb. I tell the patient to remove the cotton-wool on the second day, and to inject water freely, so as to bring away the thick coagulated mucus, which would diminish the effect of the subsequent injections. This mode of applying astringents I have likewise found extremely useful in the treatment of many uterine affections, in that of metrorrhagia also, and I strongly advise others to try the plan. Cold water douches, both rectal and vaginal, act in the same way. If we examine carefully women who have suffered much from uterine deviations, they are found likewise complicated with inflammatory congestions, erosions or ulcerations of the neck of the womb. The pathologist then infers that the pains experienced depend upon these inflammatory lesions. At all events, the indication is clear—to treat all ulcerations by the surgical modes of treatment on which I have dwelt in my work on "Diseases of Women," and to subdue inflammation, and by so doing the uterine deformity will, in some cases, be entirely removed, though in others the patient's sufferings will be only diminished. It is also equally true that in other patients the inflammatory affection of the neck of the womb may be cured, and yet they may still continue to suffer. The sequela of inflammation, the chronic enlargement of the neck of the womb or of its body, must not, however, be treated by halves, for there are patients who continue to suffer from nervous symptoms so long as there remains the smallest nucleus of organic mischief. A course of

mercury or iodine may therefore be necessary, as well as local astringent measures.

On finding uterine deviations complicated by inflammatory lesions, I employ the measures necessary to cure them; and by so doing, I sometimes succeed in dispelling the symptoms. Having in like manner arrived at the conclusion that uterine deviations are often complicated by neuralgia, the indication is to treat such cases by the means found useful in neuralgic affections. Thus I have removed, or much alleviated, the sufferings of many affected with uterine deviations by the use of sedative injections into the bowels; generally prescribing from 15 to 30 minims of Battley's solution, with a drachm of tincture of hyoscyamus, in a teacupful of warm milk.

No remedy is so effectual against the various forms of neuralgia as heat. The most efficacious remedy is the transcurrent cauterization; but as the terrors which surround the red-hot iron render it very unacceptable in a sick-room, we may seek to relieve by applying to the most painful spot a hammer previously plunged in boiling water. This was frequently used by Sir Anthony Carlisle: it is known on the continent as the "Marteau de Mayor." Dr. Day has written on the use of this application in neuralgic and rheumatic affections; and Mr. Mitchell, of Dublin, has extensively used it for the neuralgic symptoms of uterine complaints. Jobert de Lamballe has published several cases of long-continued distressing uterine symptoms, without any apparent structural change, and in which a cure was effected by passing the red-hot iron through the neck of the womb even into the cavity. Although unable to emulate the boldness of this practice yet Paul Dubois intimates, that the intra-uterine pessary has sometimes relieved patients by modifying the abnormal sensitiveness of the womb, just as the passage of a sound cures neuralgia of the neck of the bladder, or as the bistoury cures some neuralgic affections of the anus. In a case cited by Malgaigne, the woman was suddenly cured of all her sufferings by the application of the intra-uterine stem-pessary; but it was found that the deviation still remained the same.

The well-known constricting power of cold when permanently applied to animal tissues, suggested its trial, and it is often useful when given as rectal or vaginal douches, for 15 or 20 minutes, two or three times a day. Dr. Fleury has carefully experimented the utility of administering douches of cold water to patients previously placed in a state of perspiration. He has found the treatment very useful not only in subduing the pains complicating uterine deviations, but in strengthening the constitution and the nervous system, so as to permit it to bear the uterine deviations with impunity. The Administration of Paris hospitals has fitted up a hydropathic apparatus, at the hôpital St. Antoine, for my friend Dr. Aran, who completely confirms Dr. Fleury's assertions, and is able to cure the lumbo-abdominal neuralgia of uterine deviations by sweating, followed by cold water douches to the loins and pelvis. A limited experience of these

measures convinces me that much may be done to remove the neuralgic symptoms of deviation by hydropathic treatment; and that to attempt to relieve uterine displacement by instrumental interference, susceptible of doing mischief, without having previously tried sedatives and hydropathic treatment, is an injudicious mode of proceeding.

There are uterine deviations in which the complicating neuralgia resists sedatives, and all that is indicated for the cure of neuralgic affections, and then several other modes of cure may be successfully adopted. We have seen, that at the point of flexure on some uterine deviations, the tissues appeared hardened and retracted by an inflammatory process. Recamier sought to imitate this in a case of uterine retroflexion, by cauterising the internal surface of the anterior portion of the womb so as to excite the retraction of the fibro-muscular tissue, and thereby bring back the body of the womb to its right place. This was not followed by severe symptoms; but the pathological anatomy of uterine retroflexion teaches us that such measures must be useless in some, and fatal in many other cases. So this plan is not worthy of imitation.

Amussat having seen uterine cauterisations unintentionally produce the replacement of a retroverted uterus, by causing the neck of the uterus to adhere to the vagina, purposely cauterized the neck of the womb and the corresponding portion of the vagina, and he completely succeeded in setting upright a retroverted uterus in this case. Dysmenorrhœa was likewise cured, and the effects of the operation did not interfere with parturition. This plan has been repeatedly successful in the hands of its originator, but it has not been generally adopted. The fear of not being able to control the effects of the caustic applied to the vagina, the danger of parturition being interfered with by extensive cicatrices, and the fact that the cauterization did not always produce the desired effect, has prevented the adoption of this plan of treatment.

Some were struck with the fact, that patients only suffered from uterine deviations when they were standing or walking, and were free from pain at night. The inference was, that prolonged repose in the horizontal posture would restore strength to the weakened ligaments of the womb. Lisfranc's prescription, therefore, was, to lie on the back for a year or more; but this was found to weaken the constitution without strengthening the pretended uterine ligaments, or curing the deviation of its attendant neuralgia.

Again, practitioners were struck with the fact, that uterine deviations were generally most painful in married women in whom the abdominal walls had been greatly distended by gestation, and it rightly occurred to them that if they could artificially restore to the abdominal walls the tone they had lost by being over-distended, then the patient's suffering would be appeased. Many hypogastric bandages have been invented. Dr. Hull's hypogastric bandage has been highly approved of both at home and abroad. It acts by applying

increased pressure to the womb, and may sometimes slightly correct the uterine deviations: but in other cases, though the bandage may have effectually removed the pains, I found, on examination, that the uterine deviation, or retroversion, was just as extensive whether the bandage was on or off. It therefore relieves nervous symptoms by steadying the womb. That is why it is equally useful in uterine inflexions as in retroversion and anteversion, for by steadying the womb the uterine nerves are less irritated, and do not determine sympathetic pain. Some patients accustom themselves with difficulty to this bandage; but this may be in consequence of some obscure inflammatory affection. Let this be allayed, and then try the bandage again, encouraging the patient to persist in its use for a few days. This bandage is useful for women who have considerable abdominal development to support; I have found it useless and not easily borne by those who are thin and flat-bellied. In Dr. Hull's bandage, the pressure is applied to the womb and the lower part of the abdomen. In abdominal bandages, methodical pressure is applied to the whole of the walls of the abdomen. M. Bourjeaurd has invented a beautiful belt and air-pad supporter. It is made with vulcanized india-rubber tissue, and resembles his hernia belt. Madame Caplin, of Berners-street, has also repeatedly made for my patients a well-fitting elastic abdominal belt, with or without an air-pad, which has given great comfort. These bandages have the great advantage of being as well borne by thin patients as by the fat. I have assured myself, by a minute examination of patients, that they do not make straight an inflected womb, and, if they give relief, it is by coming to the rescue of the over-dilated abdominal walls. They diminish abdominal capacity, and stimulate the perinæum to support the womb by the more powerful contraction of the perineal muscles, while all the abdominal viscera are firmly pressed together, as in a perfectly formed woman. This is so true, that I have patients with uterine flexions who, when thin and out of health, suffer from the usual train of uterine symptoms, but when I send them to the country, and they grow fat, they cease to suffer. Why? Because the deformed womb then rests in a pelvis, and in the midst of pelvic organs, well cushioned and padded with fat.

If when the deviations of the womb determine excessive irritability in the nerves in connexion with it, these sufferings are best appeased by all such measures as will render the womb less moveable. It is only an exemplification in uterine pathology of a general law, which renders the slightest movement agony for those having sprained an ankle, a gouty limb, or whose heads are racked with nervous headache. This principle is of such paramount importance in uterine surgery, that I believe all the utility to be derived from most of the pessaries hitherto invented is to be ascribed to the more or less effectual way in which they fix the womb. The well-made abdominal bandage presses the womb downwards, the pessary presses the womb upwards, and their combined effect is to fix the womb.—*Lancet, Aug.* 16, 1856, *p.* 194.

114.—*On Displacements of the Womb.*—It is our impression that there is not a sufficient recognizance of the uterus as a "floating" body, or rather as a body whose mechanical conditions of equilibrium make its support more nearly analogous to that than to any other mode of support. The most considerable solid support of the uterus is the vagina. These two conditions lead to an easy understanding of many phenomena of the minor motions of the uterus, called mis-, or dis-placement. The destruction of the vaginal support by relaxation (sometimes a sort of paralysis) of the tube, often accompanied by a similar condition of the rectum, leads to the most complete displacements of the womb itself healthy,—leads also to all the ordinary symptoms of uterine ailment in the most aggravated form, and curable only on condition of curing the vagina. Again, enlargement, and consequently increased weight, of any part of the uterus, leads to sinking of it. Enlargement of the cervix leads to depression of the organ. Enlargement of the body, causing top-heaviness, leads to retro- or anti-version, or flexion. It is almost certain that the ligaments of the uterus have almost no function as ligaments, but quite the reverse, and that in those cases of displacement, where symptoms are ascribed to dragging on them, there is no such dragging at all, the uterus having free motions afforded to it by these ligaments, which are not to be put on the stretch by any ordinary misplacement. It must also be remembered in regard to uterine flexions, that the organ is sometimes so softened as not to be capable of bearing its own weight—a circumstance sometimes connected with leucorrhœa and painful symptoms. These considerations we could with pleasure follow out to much greater length. We shall only say, that their comprehension is a great object to all obstetricians, for as surely as they attain to a correct appreciation of them, so will they acquire confidence and skill in prescribing for or advising the sufferers from them. —*Edinburgh Medical Journal, July*, 1856, *p.* 70.

115.—ON INVERSION OF THE UTERUS.

By Dr. Tyler Smith.

[Inversion generally occurs between the expulsion of the child and the expulsion of the placenta. The predisposing causes are the causes of acute labour, and excessive action of the uterus. It frequently occurs independent of any mechanical cause, and obstetricians have sometimes been blamed most unjustly in case of post-partum inversion.]

The treatment consists in the mechanical re-position of the uterus. Immediate steps should be taken to reduce the inversion, because of the rapidly increasing contraction of the os uteri, which, by impeding the circulation, causes an increase in the size of the tumour. The size of the uterus should be reduced as far as possible by pressure,

and by detaching the placenta in cases where it still adheres. By moderate but sustained force the uterus is then to be passed up through the vagina and os uteri. After the organ has been partly passed through the os uteri, the muscular action of the uterus itself assists in restoring it to the proper position. It is reinstated with a sudden jerk, causing a considerable report at the moment of its restoration. In cases where intus-susception exists, the hand must be passed through the os uteri, so as to overcome the annular contraction, and to restore the intus-suscepted portion to its proper position. Cases of intus-susception and inversion require careful watching until the uterus has permanently contracted. Although it may justly be said that inversion may occur when the accoucheur is entirely blameless, I do not think the same can be said when the case is allowed to remain unreduced, and the patient lives on in a state of extreme misery and danger. It would be extremely culpable if such an accident either passed unrecognised, or if the first few hours after labour were allowed to pass without the re-inversion of the uterus. I cannot suppose that with proper and prompt management any case could be considered irreducible, within a reasonable time after the accident. Suppose the os uteri to be in a state of spasmodic contraction, we have in chloroform a powerful means of rendering it dilatable, and of allaying pain when the tender state of the uterus is such as to prevent the necessary manipulations. In these cases promptitude in action is of the greatest consequence. Every hour that elapses after the accident before the reduction of the inversion is effected increases the difficulties in the way of its accomplishment. Very rare cases are met with, in which menstruation has been normally performed with an inverted uterus, and when the presence of a tumour in the vagina, and a constant leucorrhœal discharge have been the only symptoms; and cases are recorded in which the uterus has spontaneously re-inverted itself a considerable time after delivery. Usually, however, the patient is subject to an almost constant drain of blood and mucopurulent discharge from the inverted mucous surface, and she perishes after a longer or shorter interval. The alternative, when reposition is considered impossible, is, the extirpation of the inverted organ by the dangerous operations of the ligature or excision.

There are some other abnormal actions of the uterus, allied in some respects to inversion, to which I must now direct your attention.

Encysted placenta is a term sometimes applied to cases in which a sphincteric contraction of the os uteri comes on rapidly after parturition, before the placenta has been expelled. The placenta, in these cases, may be either attached to the uterus, or may have been thrown off, and be lying close within the contracted os uteri. This complication is most common after acute labours, or in prolonged labours, where the pains have been excessive, up to the time of delivery. Excepting that it occurs after delivery, instead of in the early stage of parturition, it is comparable to that form of rigidity, in which

sphincteric contraction of the os uteri is predominant. Owing to the increased mobility which the os uteri acquires during the progress of labour, its post-partum contractions are sometimes more forcible than any active contraction which occurs before delivery; and the rigidity is never mechanical, because of the great dilatation which has occurred during the progress of labour.

In treatment, it is of considerable importance to deal promptly with these cases. The longer the os uteri remains contracted, the more difficult will its dilatation, so as to admit of the extraction of the placenta, become. If the placenta can be felt close to the os uteri, gentle but firm traction of the cord, held as near as possible to its root in the placenta, should be used, so as to convert the placental mass into a dilator. We can often beneficially assist the effects of traction of the umbilical cord in dilating the os uteri, by gentle pressure exerted externally upon the abdominal surface, at each recurrence of the uterine contractions, sweeping the placenta, as it were, into the pelvis and towards the os uteri, by the hand, while steady traction of the cord is being kept up. If these methods should not be successful, the os uteri must be slowly dilated by the fingers, so as to admit the hand or fingers, according as the placenta may be required to be detached from the uterus, or merely withdrawn from the cavity. The utmost gentleness, consistent with the necessary force, should be employed; and, if necessary, any threatening of convulsion or laceration should be prepared for by bloodletting. If the patient's mind should be excitable, or the dilatation of the os uteri should be painful, an opiate is of great use; but it acts rather by soothing mental emotion and allaying pain, than by reducing the spasm of the os uteri. When the case is misunderstood or neglected, and the woman survives the shock and the effect of the loss of blood, her life is generally one of danger and misery. I have met with several cases of encysted placenta, where the secundines had been allowed to remain a considerable time, and where the os uteri was in a state of the most perfect contraction, where chloroform was of the greatest use in relaxing the os uteri, and allowing the accoucheur to perform the manipulations necessary for the removal of the placental mass.

The foregoing remarks apply to cases in which the placenta is either wholly adherent to the uterus, or the whole uterus is so firmly contracted upon the separated placenta as to prevent internal uterine hemorrhage. Cases, however, occur in which spasmodic closure of the os uteri is attended with separation of the retained placenta, and inertia of the body and fundus. In such cases, dangerous internal hemorrhage is inevitable, and the removal of the contraction of the os uteri becomes quite secondary in importance to the arrest of the hemorrhage. Our first object here must be to excite such an amount of uterine contraction as to stay the loss of blood. In all cases where the first steps taken for the dilatation of the os uteri, which of

themselves tend to produce uterine contraction, are ineffectual, the uterine inertia should be treated most energetically, without any reference to the state of the os uteri.

In some cases of retained placenta the uterine spasm is not situated at the os uteri, but at the junction of the cervix uteri with the body of the organ; in the same situation, in fact, as the narrow portion of the organ in the unimpregnated state, and at which the greatest resistance is met with in the introduction of the uterine sound. This state of the uterus is called hour-glass contraction. In other cases the constriction is still higher up, involving the body of the uterus, being similar in its nature to those band-like spasmodic contractions, which are sometimes observed in the large intestine. In the lower animals, where the uterus in its anatomy resembles an intestine, there can be no difficulty in understanding this form of annular contraction.

In other cases, the hour-glass contraction occurs after the separation of the placenta, when it may be the cause of internal hemorrhage, because of the inertia of that portion of the uterus which is above the stricture. After the expulsion of the fœtus, the contractions of the uterus ought to be uniform in the entire organ, so that in hour-glass contraction there is always a double departure from the physiological condition of the uterus; there is both spasm and inertia. The treatment of these cases must be conducted on the same principles as cases of sphincteric contraction of the os uteri; but we have an additional remedy, of considerable efficiency, in frictions applied to the abdomen over the uterus. True and complete hour-glass contraction is a rare affection; but in very many cases of post-partum hemorrhage, portions of the uterus are spasmodically contracted, while others are so relaxed as to admit of the flow of blood from the mouths of the vessels on its internal surface. Occasionally it happens that one lateral half of the uterus will be contracted while the other half is relaxed. In cases of hemorrhage, with hour-glass contraction, there may be no escape of blood per vaginam, the effused fluid being confined in the upper chamber of the uterus by the stricture.

The causes of hour-glass contraction may be any of the causes of acute, irregular, or tardy labour; but it most generally occurs after rapid parturition, particularly the rapid transit of the child through the external parts. Coagula in the uterus, the retained placenta, or improper traction of the cord, and mental emotion, are all exciting causes of the accident.

It will be useful to compare the different forms of irregular action of the uterus with each other. The resemblance between the spasmodic form of rigidity of the os uteri during labour and the most simple form of encysted placenta—namely, sphincteric closure of the os uteri with retention of the placenta—is at once obvious. The same contracted state of the os uteri is present in inversion, after the uterus has descended through the os uteri. In the form of encysted

sacenta, or irregular action of the uterus, constituting hour-glass contraction, we have precisely the same condition of the middle portion of the uterus as that which obtains in the second stage of inversion-plus. In simple hour-glass contraction, the cavity of the uterus is divided into two parts by the contraction of the middle portion of the organ: but now, owing to irregular action of the fundus, this part of the organ descends into the cavity of the uterus, and the hour-glass contraction then occurs, the fundus uteri is seized by the contracting ring of the uterus, borne down through the os uteri and vagina, and inversion is thus rendered complete. After the inversion, the os uteri, which dilates to allow the inverted uterus to pass, becomes firmly contracted. In all these abnormal actions, occurring after delivery, are but modifications or excessive after-pains. In severe after-pains, it is easy to feel with the hand that the uterus becomes hard and prominent at particular points, and soft and depressed at others. From these irregular contractions the more serious irregularities of uterine action arise. Sphincteric and premature closure of the os uteri is the most simple derangement; next comes the annular contraction of the upper part of the cervix, or the body of the uterus, in hour-glass contraction; and lastly, the phenomena of inversion, which is the most compound of all these disordered actions. Thus rigidity of the os uteri, encysted placenta, inversion of the uterus, hour-glass contractions, and excessive after-pains, are merely modifications of irregular uterine action, and they are all convertible one into the other. These views materially simplify our comprehension of these post-partum accidents. It may be said, however, that hitherto they have generally been treated of in an isolated manner, and with little reference to uterine physiology, or to their evident relationship with each other.—*Lancet, October* 11, 1856, *p.* 397.

116.—TREATMENT OF PROCIDENTIA UTERI AND RUPTURED PERINÆUM BY PLASTIC OPERATIONS.

By I. Baker Brown, Esq., St. Mary's Hospital.

[There are very few female complaints so painfully distressing, and which cause such a miserable state of existence as displacements of the womb: more especially if associated with rupture of the perineum. "Baker's operation" for such cases has already been performed so often and so successfully that we may consider it to be well established.]

The special points to be observed in this operation, (after the horse-shoe denudation of mucous membrane has been effected,) are, in a few words, the deep suture, the division of the sphincter, the free use of opium, general diet, and frequent catheterism. With regard to the second point, the division is not performed unless in cases of ruptured perinæum. Prolapsus of the uterus, without rupture of the perinæum

does not require it; in fact, the great success of the operation for the latter depends upon this—a most valuable point, overlooked by the venerable Roux. Moreover, the manner in which the quilled suture is applied is another very essential matter. We have seen M. Roux perform this operation, and, on contrasting it with that of Mr. Brown, the material difference is the depth at which the latter gentleman passes his sutures, as compared with that of the former. This would not, perhaps, strike any one who has not witnessed the operation by both surgeons. We know for a fact that M. Roux did not divide the sphincter, and the credit of this very great improvement is solely due to Mr. Brown.

In the cases which we had the opportunity of examining on several occasions, the new perinæum formed by the plastic operation was thick, strong and firm, feeling like a distinct bridge or arch reversed, and as if a transverse muscle had been formed. This condition, with proper firmness, is nevertheless yielding; subsequent gestation has proved this, without the apprehension of a fresh rupture.

One case of prolapsus was associated with a ruptured perinæum, which extended up to, but not through the sphincter; she was consequently predisposed to prolapsus. In the majority of cases where children have been born, this condition is generally a result sooner or later of the rupture.

[We will now give a condensed report of one of these cases which is much similar to many others which are given. Julia ——, aged 21, was admitted on Feb. 29th, 1856. Three years ago she strained herself by lifting; pain and bearing-down came on, with discharge. Since then the womb has always protruded on assuming the upright position and during defecation. It returns when lying down, but not without manipulation.]

The patient is fleshy, and apparently in good general health. Has enlarged tonsils. The uterus protrudes completely; it is larger than natural; the os is abraded. The perinæum is very narrow, but whether congenitally so, or in consequence of continual pressure having produced absorption, does not appear. Has slight leucorrhœa; her voice is husky; has had syphilitic ulceration.

On the 3rd of March Mr. Brown performed his usual operation of denudation of the mucous membrane within the lips of the vagina, consisting of a piece an inch long and three-quarters wide, the upper edge of which was on a level with the meatus urinarius, and dissected off longitudinally. Then the mucous membrane was dissected off laterally and posteriorly in the shape of a horse-shoe, the upper edge of the shoe commencing half an inch below the lateral points of denudation. Two deep quilled sutures were then introduced, and, when the parts were brought together, the edges of the new perinæum were united by interrupted sutures. Two grains of opium were ordered on recovery from the effects of the chloroform, and one grain every four hours. As

there was more hemorrhage than usual, ice was placed in the vagina, which staunched the bleeding for a time; it was, however, effectually checked by gallic acid, tincture of opium, and camphor mixture. There was some pain in the parts; the pulse was quiet and the skin cool, and the abdomen was free from pain.

On the fourth day, pain in the parts continued, as well as in the limbs, from her constrained position; she had passed a sleepless night, and had much sickness; her catamenia also appeared. These symptoms disappeared subsequently.

On the fifth day the deep sutures were removed, and a minute slough in the orifice of the tract of the anterior suture of the left side.

On the sixth day, the parts were evidently well united; she was now taking one grain of opium night and morning. With the exception of some swelling of the right labium, and a blush which spread towards the pubis, the parts were perfectly united by the twelfth day, some little irritation being complained of from the catheter and consequent pain.

She was discharged from the hospital on the 29th of April, and, as her general health was not very good, she became an out-patient. At this time the uterus was still heavy, and somewhat low down; there was a little pain and bearing-down, and together with general treatment she was enjoined to avoid the erect posture as much as possible.—*Lancet, June* 21, 1856, *p.* 687.

117.—*Treatment of Ruptured Perinæum.* By Dr. W. Wilson, Vienna.—The treatment of ruptured perinæum is usually so uncertain and unsatisfactory, and the result so painful, both to patient and practitioner, frequently involving the latter in undeserved discredit, that, perhaps, if not generally known in England, a few remarks on the mode of treatment here may not be unacceptable. It possesses two recommendations,—simplicity of application and a result invariably superior to that observed under the ordinary methods. I have myself witnessed several cases which have excited my surprise, as I have been taught to regard a ruptured perinæum as one of the greatest misfortunes that can happen in the practice of an obstetrician. For the last twelvemonth the serres fines of Vidal have superseded, at the Vienna Lying-in-Hospital, all kinds of sutures or other mechanical means of approximation. They are applied as soon after the expulsion of the placenta as circumstances will permit, that is, where all bleeding has ceased, one, two, or three, according to the extent of laceration. Sometimes a slight preparatory paring of the lacerated edges of the wound may be necessary; they are allowed to remain eight or ten hours. After removal, the parts are kept cleansed, by allowing some tepid water to run over the wound two or three times a-day from a sponge; a *sine qua non* is that the patient be kept on the side till the termination of the cure, to prevent the contact, as much as

possible, of irritating discharges. In those cases which I have observed, union has supervened in from eight to twelve days; and some were severe, resulting from the forcible impaction of the fœtus, coupled with narrow vaginal outlet. If the serres fines are allowed to remain more than ten or twelve hours, they often produce the same ill effects as a suture; of course the patient's legs are kept in apposition and rest as much as possible.—*Medical Times and Gazette, August* 30, 1856, *p.* 215.

118.—*Case of Laceration of the Perinæum.* By ARTHUR TAYLOR, Esq., Kingsclere.—[The following case is interesting, as it tends to disprove the generally received notion, that complete rupture of the perinæum and sphincter ani are incurable without an operation. The presentation was such as most frequently gives rise to this kind of injury, viz.,—with the occiput to the sacrum; when the head begun to press on the perinæum, unusual care was taken to give the necessary support. Mr. Taylor says that he had his hand on the perinæum, and was awaiting the next pain, when the patient]

In the most sudden and unexpected manner, while pressing her feet forcibly against the bed-post, withdrew herself most completely out of my reach, and before I could again give such assistance as was necessary, the child was completely expelled. The act was almost instantaneous. I, of course, conceived what was the true state of affairs, and an examination too sadly verified my fears. At that time such cases were generally deemed incurable, and a poor creature so afflicted was considered only as an object of pity and disgust; it was, therefore, with much pain that I reflected on the seeming hopelessness of her condition. Having approximated the knees by a bandage, and informed my patient of what had occurred, I returned home without doing anything more. At my next visit, the following day, on introducing the forefinger of one hand into the rectum, and that of the other into the vagina, it was with some difficulty that I could reach the upper part of the lacerated septum, having done which, and placed the points of the two fingers together, I then withdrew them through the whole of the torn parts without any opposition. It will thus be seen that not only were the sphincter and perinæum completely ruptured, but the recto-vaginal septum also. In order to give the laceration a chance of healing, I determined to lock up the bowels, and with this intention administered repeated doses of the compound chalk mixture, with tincture of opium. On my third visit, it was gratifying to find that a small band of perinæum, just behind the commissure, had united, and that the septum had healed slightly from above downwards.

At my fourth visit, still greater improvement had taken place, and, in addition, the sphincter was beginning to heal. When I next saw her, on the fifth day, my visits having been diurnal, the case had a

every respect greatly improved. On the sixth day, the septum was so nearly healed that not more than half an inch remained unclosed. At the end of one week the edges of the sphincter and perinæum had become quite united, the latter being a little shorter than before the accident, while the septum was so nearly closed, that on passing a finger into the rectum, and another into the vagina, there was some difficulty in making the nails of such fingers touch through the wound.

Up to this period the bowels had been kept free from any evacuation; and as there was now some febrile symptoms setting in, a dose of castor oil was administered, and continued daily for another week. In a fortnight more my patient had perfectly recovered, and she has since borne children without any untoward event.

In the above treatment of the case it will be seen that little was attempted to be done; yet it clearly shows that Nature, slightly assisted by art, is sometimes able to effect a cure where it is least expected.—*Lancet, June* 14, 1856, *p.* 655.

119.—*Elm Tents for Dilating the Cervix Uteri.* By Dr. H. R. Storer, Physician to the Boston Lying-in Hosyital.—[Dr. Storer is well known as the joint editor with Dr. Priestley of Professor Simpson's collected writings. He here speaks of the advantages possessed by tents of elm bark over those made of sponge.]

"The chief excellencies," he remarks of sponge, "its rapid and great expansibility may at once become its greatest dangers. If there be present unhealed lacerations of the cervix, so common after recent delivery, and at times remaining, I have no doubt, long ununited—if that organ, or the tissues surrounding it, be the seat of disease, whether carcinoma in any stage or otherwise—fatal injury might be at once produced by the force of rapidly expanding sponge—a force whose amount would hardly be imagined. Exerting this powerful pressure in every direction, though more especially upon the sides, it of course follows up the least resistance; where the cervix has been unusually stubborn and unyielding, I have frequently known it to thrust itself completely back into the vagina; where a side, or a tissue, or a fibre were morbidly weak and yielding, or where the slightest crevice existed, we ought not to wonder at any symptoms of peritonitis."

In attacks of pelvic cellulitis, Dr. Storer has seen the disease directly dependent upon irritation produced by the forcible expansion of the sponge against unyielding tissue: and he calls attention to its rapid decomposition when subjected to the various secretions of the vagina and uterus as forming an element in the production of pelvic abscess. Following out a suggestion of Dr. M'Dowall of Virginia, the author was induced to try the elm bark as a substitute for sponge tents. It is less expansible, and so dilates more gradually; it is not decomposed, and it furnishes an abundant mucilage which protects irritated or abraded surfaces. Dr. Storer has no doubt that some preferable

substance may in course of time be discovered; but, meanwhile, the elm bark tent appears to him—and we think on fair grounds—superior to that made of sponge.—*Glasgow Medical Journal, April* 1856, *p.* 116.

120.—*The Induction of Premature Labour.* By Dr. Copeman.—In inducing premature labour, Dr. Copeman recommends a proceeding not commonly practised, and one which, if it could be relied upon, has some advantages over those generally in use. It consists in passing an œsophagus bougie or tube a distance into the uterus, between its inner wall and the chorion. We need not insist upon the superiority of this proceeding over that of rupturing the membranes, or of its simplicity in comparison with the douche, or the introduction of sponge tents; and two cases appended speak favourably of its efficacy.—*British and For. Med. Review, July* 1856, *p.* 149.

121.—*Large Tumour of the Labia removed by the Ecraseur.*—[The écraseur of M. Chassaignac promises to be a most useful and not unwelcome addition to our means of preventing hemorrhage in operations on very vascular parts.]

From what is seen every year in our larger hospitals, the saving or entire prevention of hemorrhage after surgical operations is plainly a most valuable point gained in the prophylaxis or prevention of sloughing, pyæmia, hospital phagedæna, &c., after exhausting operations; and if the *écraseur* be found, after a more general experience of its value, to fulfil the various indications pointed out by M. Chassaignac in his recent volume—if this instrument, in a word, shall have the effect of leading the surgeon also to dispense with ligatures of vessels and the dangers of secondary hemorrhages, we shall have less dread of the depressing influences of chloroform, and more certainty of the recovery of patients from large and serious wounds, as in the present instance.

The tumour in the present case was not much smaller than a child's head, occupying one side of the organs of generation. Mr. Lawrence used the *écraseur*, as we previously described. Six or seven minutes were sufficient for the removal of the growth, and, up to the present, the patient has gone on very well. The parts were brought together as in the previous case; no ligatures of vessels were required; and, under the effects of chloroform, one might conceive no operation at all was going on. The venerable and deservedly esteemed senior surgeon of St. Bartholomew's remarked, that a new era in surgery had opened, of which he had little dreamed—a large tumour, the size of a child's head, being removed from the most sensitive part of the female system, without bleeding, without knives or ligatures, without pain!—*Association Med. Journal, August* 2, 1856, *p.* 647.

122.—TREATMENT OF OVARIAN DROPSY BY IODINE INJECTIONS.

By Dr. C. Edwards, Cheltenham.

[A young lady, aged 29, stated that about twelve months before, her abdomen began to swell and has rapidly increased. She was anæmic and emaciated. The measurement round the abdomen was forty-four inches. In consultation with Mr. I. B. Brown, of St. Mary's Hospital, the cyst was considered to be multilocular, and she could not be expected to live longer than twelve months, if left to herself. Injection with six ounces of the tincture of iodine Ph. Ed., simply through the canula by a glass syringe was recommended, though it was thought to be one of the worst kind for this treatment.]

After this consultation, having felt certain misgivings as to either being able to safely lodge the iodine in the emptied cavity by the simple syringe and canula, or by such means to sufficiently wash its distant anfractuosities, I resolved on taking the responsibility both of *more efficient injecting power* and *more iodine*. Accordingly I had a No. 16 prostate catheter supplied me by Weiss & Son, accurately adapted to pass through the canula of a trocar, made from a pattern kindly lent them by Mr. Brown. This tube, by a very simple screw contrivance of my own, I had attached to the moveable stock-cock nozzle of a large gum-elastic bottle.

On July 15th, at noon, in the presence of Dr. Colledge, whom the patient had previously consulted, several relatives, and Mr. Morris, surgeon, who administered chloroform, I perforated the left linea semilunaris with the large trocar, and pressing in the canula as far as I could, the ovarian mass being at the same time compressed, and the canula having to be repeatedly cleared of viscid obstruction, I evacuated twenty measured pints of *a very thick*, viscid, mushroom-ketchup-coloured fluid. Hesitating now still further as to simply injecting with the syringe, I introduced the prostate tube nearly its whole length through the canula, and, with all the compressing force I could exert on the elastic bottle, I injected ten measured ounces of the Edinburgh strength, fresh made from sublimed iodine, thus thoroughly washing the cystic parietes. The hard, irregular, emptied mass was now strongly compressed by pads and a firm flannel roller, and a pill, containing two grains of opium, was given at once.

The *scarcely to be called fluid*, examined chemically, was solidified by heat and nitric acid, and, microscopically, exhibited abundantly the large compound granular masses, ("exudation corpuscles,") granules, and numerous cholesterine crystals, &c. &c., as diagramed by Dr Druitt in his last edition, p. 483.

I next proceed to the *sequelæ of the operation and after treatment.* At 5 p.m., vomiting had just commenced, and continued violently, with scarcely fifteen-minute intervals, till nine next morning. No perspiration; pulse weak and 140; burning sensation commenced in the

throat, with excessive thirst and difficulty of deglutition. The fluid ejected tasted sour, hot, and bitter, but not like sea-weed. To take two grains of pure opium in the form of pills at bedtime; brandy and soda-water *ad libitum*, arrow-root and brandy, and if possible beef-tea.

16th. Vomiting has somewhat subsided since 9 a.m.. From the incessant vomiting she had not slept more than half an hour since the operation, although having taken four grains of opium. She passed in the night upwards of two quarts of limpid urine. All the other symptoms, except the vomiting, somewhat aggravated; *cephalalgia is intense;* the eyes protrude and glisten; pupils dilated; no delirium. Ordered to proceed with stimulants and nutrition.

17th. Vomiting has entirely ceased; urine high coloured, and less copious; appetite ravenous for bread, &c.; much thirst; had slept four hours last night. Ordered to proceed with wine, brandy, and nourishment.

18th. Mouth and throat "have a more metallic feeling;" perspiration and thirst increased: appetite diminished; tongue dry and brownish; skin cooler; pupils less dilated; bowels confined; sickness returned. To have a pill, and afterwards a purgative draught. Vomited four times since taking the pill. Ordered a purgative enema.

19th. Bowels have thrice freely responded; pulse 106, and fuller; all the symptoms of iodism are abating.

22nd. Can get out of bed. Ordered to agitate her body gently by walking a little.

24th. She is up and dressed, and feels quite well.

I have removed the compresses and the hot flannel bandage, which she thought loose, and that it could be borne much tightened; and with fresh compresses, and Nickel's elastic plaster, *instead of a belt*, I strapped up the abdomen with considerable pressure, with which, from its equal distribution, she is quite comfortable. Ordered to take gentle exercise in the open air, to live generously, and to keep up the pressure.

I beg to append a few observations:—

1st. No pain whatever, nor even sensation of any kind, except "that of a bubbling," was felt in the abdomen, from the time the iodine was injected till now. She was perfectly conscious during the injection, having been merely chloroformed to prevent pain from the use of the trocar.

2ndly. Iodine was chemically disengaged from every accessible excretion and secretion, even the saliva, perspiration, and *tears*.

3rdly. It having been my lot to inject the largest quantity of iodine ever thrown into the human body, ten ounces, Ph. Ed., which, not only from the quantity of iodine dissolved but from its *concentration*, must equal in effect nearly 30 ounces of the English tincture, and this with efficient force and contrivance, both the preparation of the iodine and my operation having been public, and attested scientifi-

eally, the result of my case (which shall be faithfully forwarded in due time to the 'Lancet') will be a decisive index of the *real value* of iodine as a remedy in ovarian dropsy, as I trust the above detail of the operation and its sequelæ is an exponent of the quantum of risk remedially involved.

4thly. Should this enormous quantity prove efficient, and be in future resorted to, stimulants *freely exhibited* both during and after the operation, in my opinion, formed after close observation, reduce the remedial risk to its minimum, and the patient may be considered safe therefrom in about sixty hours.

P.S. Aug. 20th, 1856, *six weeks after operation*.—No reaccumulation of fluid whatever. A fulcrum bandage over the elastic plaster, with compresses applied at each side of the emptied ovarian mass, and admitting of *gradual tightening*, has been kept applied. A reduction of four inches around it has been effected during the last fortnight. Miss D. is gradually, but steadily, improving in her general health, and I have not found it necessary to order any medicines. She is gone to the sea-side to-day for her amusement and health.—*Lancet*, *Aug.* 30, 1856, *p.* 247.

123.—SIMPLE INSTRUMENT FOR INFLATING THE LUNGS OF ASPHYXIATED INFANTS.

By Dr. James G. Wilson, Glasgow.

[Many methods and instruments have been recommended for inflating the lungs in cases of suspended animation in infants. The readiest, and perhaps the best, although not very agreeable, is by applying the mouth to the mouth or nose of the child. This is often very fatiguing when long continued, and is further open to objections as all other methods are. Dr. Wilson describes his apparatus as follows:]

The instrument essentially consists of a vulcanized India-rubber ball about the size of an orange, to which is attached a German-silver tube, about five inches long, and gently curved towards its free extremity. The tube is closed at the extreme end, but has two openings or eyes, like a female catheter a short distance from the point. On compressing the ball, the contained air rushes along the tube and through the openings above mentioned; and on removing the pressure the ball rapidly expands, and becomes instantly re-filled with air, which may again be evacuated as before. On introducing the tube into the larynx and acting in this manner, it is obvious that for the next inspiration the same air would be used over and over again, which would be a disadvantage and a decided objection. This I overcome by a very easily remedied alteration, viz. opening in the tube, at a certain distance from its attachment to the ball, for the free ingress of fresh, cool, dry air. During the compression of the ball, the left thumb will easily cover the opening, which must, however, be removed to admit the entrance of

pure air during the subsequent expansion of the ball. This opening being somewhat larger than the other two, and being much nearer the ball, readily permits the introduction of fresh air. The left index finger passed into the posterior part of the mouth, with the child's head a little thrown back, will tend to facilitate the proper insertion of the tube into the larynx. It is not necessary, as when other methods of inflation are used, to push back or depress the larynx, in order to prevent the transmission of the air through the œsophagus. The insufflation of the lungs must be gently and slowly performed, so as to imitate the normal respiratory process. After each inflation, the chest must be slightly compressed, with a view to expel the remaining air in the lungs.

The advantages of this instrument appear to me to be as follows:— It is abundantly simple, both as regards principle and construction. It can be easily introduced, and worked for any period with little exertion; and, from its small size, is very portable. The air *blown* into the lungs is at once pure, cool, and dry, and the force with which it may be propelled can be easily regulated. It is not so liable to rupture or injure the air-cells, which I have reason to fear is sometimes done in consequence of too violent restorative attempts at insufflation with the mouth or with the bellows. The irritation which the presence of the tube may occasion in the fauces and larynx, instead of being detrimental to the child, as I have heard remarked, ought of itself in many cases to have a salutary and beneficial effect, as tending to excite a gasping inspiration or a convulsive sob. If the instrument is properly applied, the air is more certain to enter the lungs, and less likely to pass into the stomach and distend the intestines, as is too often the case when the mouth alone is used, even although the larynx be pressed back. Many infants, I am convinced, are lost from the process of respiration being impeded by the presence of fluid or mucus in the air-passages, and which, from inherent weakness and debility, they are unable to expel. This is indicated by a peculiar gurgling sound when the child attempts to breathe. This collection of mucus or fluid in the respiratory passages is, I conceive, most likely to occur when the child's head is the last part to be born, and particularly when retained in the vagina for some time. This may arise from two causes. The impression made on the cutaneous nerves of the chest by contact with the atmospheric air induces the child to inspire, and thus to draw in mucus or other fluid lying in the vagina in contact with the mouth. The entrance of any fluid into the larynx or trachea in such cases may be also occasioned by gravitation. Of course the fluid may enter the œsophagus, but this is of minor consequence. This cause of suspended or interrupted animation in the infant has been too much overlooked and neglected. With the instrument above described I have on several occasions succeeded in withdrawing large quantities of fluid from the air-passages, with the effect of materially relieving the breathing. When the fluid is in large quantity, the tube may become clogged up, and the

ball partly filled, when it becomes necessary to withdraw the instrument, and clear it of all the fluid, otherwise it will be again injected into the air-passages. Great care must be taken not to introduce the tube into the œsophagus instead of into the larynx. In the slighter forms of asphyxia the use of the instrument is quite unnecessary, and, when employed in urgent cases, it does not prelude or interfere with the use of other means, such as the alternate immersion in the hot and cold bath, stimulants applied to the surface, or introduced per rectum, &c. It is now about three years since I first constructed this little instrument, and it is so very simple that any person can easily make one in a few minutes.—*Lancet, August* 16, 1856, *p.* 195.

[Mr. A. G. Osborn, of Stourbridge, in a note to the Editor of the *Retrospect*, makes a useful suggestion in the treatment of asphyxiated children. He writes]

"In vol. xv. of 'Retrospect,' p. 107, is an article quoting M. Depaul's opinion that artificial inflation in the suspended animation of still-born children 'should be performed with a tracheal tube, and kept up till the child cries loudly, &c.'

"I quite agree with this, having recently seen an infant which, born without signs of life, began to breathe *whilst I kept up* with my mouth artificial inflation from time to time, but ultimately died because these efforts were too soon suspended; for I was *obliged* to attend to the mother, and had handed the child to an attendant, to take down stairs to the fire. Before I could rejoin the nurse the little one was dead.

"In this case I practised what I thought was of great service. I placed the child on its back upon the hot iron slide from the oven, previously wrapping it in flannel; it *kept up* heat to the whole length of the spine, and must have influenced the medulla, as it warmed the nape of the neck."

124.—OBSERVATIONS ON CARBONIC ACID AS A LOCAL ANÆSTHETIC IN UTERINE DISEASE.

By Professor Simpson, Edinburgh, and Dr. Williamson, Brighton.

Dr. Simpson, in a paper, read before the Obstetrical Society of Edinbro', said, he had used carbonic acid successfully as a local anæsthetic, in neuralgia of the vagina and uterus, and in various morbid states and displacements of the pelvic organs accompanied with pain and spasms. He had found it also sometimes of use in irritable states of the neighbouring organs. Two years ago he had under his care from Canada, the wife of a medical gentleman, who was suffering much from that most distressing disease —dysuria and irritability of the bladder. Many modes of treatment had been tried in vain. The injection of carbonic acid gas into the vaginal canal several times a-day at once produced relief, and ulti-

lately effected a perfect cure. She has remained well since her return to America, and lately became a mother. Occasionally, relief follows immediately. In two or three instances, he stated he had seen the use of the gas continued only for months, and that he had notes of one case where the patient was entirely and almost entirely kept to the supine position for years, from feelings of pain and bearing down on the rectum and accelerating pulse, particularly on attempting to sit or walk. Many cases of the kind were cited by himself and others, with little or no benefit. One has, however, at last regained in a great measure the power of progression, and freedom from suffering in the erect posture—a result which she herself ascribes to the local application of carbonic acid gas.

In practice, he generally used a common wine bottle for the formation of the carbonic acid gas, and formed the gas by mixing in the bottle six drachms of crystallized tartaric acid with a solution of eight drachms of bicarbonate of soda, in six or seven ounces of water. A long flexible caoutchouc tube conducts the gas from the bottle into the vagina. The cork fixing this tube into the mouth of the bottle should be adapted so as to prevent any escape of the gas by its sides. With this view, the cork should be perforated by a metallic tube, and covered externally with a layer of caoutchouc. In a case in which the two preceding children were both lost, he had successfully brought on premature labour at the eighth month, by the repeated application of carbonic acid gas to the vaginal canal with this apparatus—the carbonic acid not acting directly as a specific oxytocic or excitor of uterine contraction, but indirectly only by distending greatly and mechanically (as examination with the finger proved it to do) the vaginal canal, and ultimately separating, like the injection of water, the membranes from the cervix uteri.

The application of carbonic acid as a local anæsthetic to the uterine mucous surfaces and to other parts of the body is not a discovery of late times. He had found that in this, as in many other examples, that what appeared at first novel, was, when fully investigated, a practice known previously in its essence, and perhaps in its more minute details also. Besides here, as elsewhere, when once a principle is detected, such as the anæsthetic power of carbonic acid gas when applied topically, we can explain by it the good effects of modes of practice which, previously perhaps, we were inclined to ridicule and reject. The fact that carbonic acid, when locally applied to a mucous surface, acts as a sedative or anæsthetic, explains a practice common among the ancients, viz., Hippocrates, Paulus Ægineta, Ruelf, Paré, &c., all of whom used to burn herbs, aromatic and medicinal, and convey the fumes by means of tubes and appropriate apparatus to the interior of the vagina; and such vapour being loaded with carbonic acid, it is more than probable that if such treatment was effectual, it was through the anæsthetic properties of the gas here alluded to. Again, there is a modern practice much in vogue on the Continent, of

injection into the vagina, &c., with the thermal waters of Nuheim, Marienbad, &c., the utility of the practice, which Dr. S. has been assured by his friend, Dr. Funck, of Frankfort, is most marked in some diseased states, will find its true explanation in the local anæsthetic effect of carbonic acid, as these waters contain a large quantity of the gas. A knowledge of the topical effects of carbonic acid serves, perhaps, also to afford an explanation of other points in common therapeutics; as, for example, its action in subduing gastric and intestinal irritation. Hence the use of effervescing mixtures, mineral waters, &c., in gastric irritability and nausea: perhaps the antacid action of the alkali may have some effect, but most likely it is the anæsthetic properties of the carbonic acid gas. The sedative and curative effects of injections into the rectum of carbonic acid gas in dysentery have a similar explanation, and serve to corroborate this view of its action. As an example of its use as a local anæsthetic to a cutaneous surface, Dr. S. alluded to the *cataplasma cerevisiæ*, or yeast poultice, which exhales from its surface a quantity of the gas. It was commonly applied to irritable and sloughing sores, and its soothing, healing, and antiseptic properties were doubtless owing to the carbonic acid gas. As an anæsthetic application to cancerous ulcers, the effects of carbonic acid gas are excellent. Dr. Ewart of Bath, says, "he has kept a person in ease and comfort, who, for so great a length of time before, had known only agony and torture." "What," he elsewhere observes, "strikes us in the two preceding cases with the greatest astonishment, is the *almost instantaneous relief of pain*, which *never failed to follow the application of the gas*." In reference to the effects of carbonic acid upon raw surfaces and wounds, Dr. Ingenhouz mentioned to Beddoes, the following experiment:—"Blister your finger, so as to lay bare the naked and sensible skin. The contact of air will produce pain; put your finger into vital air (oxygene), and this will produce more pain; introduce it into fixed or azote air (carbonic acid or nitrogen), and the pain will diminish or cease." In relation to this statement, Dr. Beddoes informs us that he made the following experiments on three different persons:—1st. The raised cuticle of a blistered finger after all access from the cantharides had ceased, was cut away in carbonic acid gas. No pain was felt. 2ndly. A second blister being opened in common air, smarting pain came on. In a bladder of fixed air, this pain soon went off. 3dly. After opening a third blister, the finger was constantly plunged into oxygene. It felt as when salt is sprinkled on a cut. In carbonic acid gas, the pain in two minutes was subdued; but returned when the denuded skin was again exposed to the atmosphere. If there be no source of fallacy in these experiments they certainly point to one kind of improvement in the treatment of some painful burns, wounds, &c. For they appear to suggest the possibility of the suffering which is attendant on such injuries being controlled and concealed by keeping the pained parts in [illegible] gas or fluid, capable of

acting as a local anæsthetic. If the reports of Ewart, Beddoes, and Fourcroy are correct, we ought also, indeed, to find carbonic acid an excellent application even as far as the mere healing and cicatrization of the broken surfaces are concerned.—*Edinburgh Medical Journal, July*, 1856, *p.* 90.

[Dr. Williams, of Brighton, in referring to Professor Simpson's observations "On the Anæsthetic Effects of Carbonic Acid in Uterine Diseases," says that in Marienbad it plays a very important part among the curative agents in use there, and in particular in the form of the "Gas Bath," which was in great repute throughout Germany.]

The "Guide Books" abound with accounts of its therapeutic properties, many of which my friend, Dr. Hirzig, resident practitioner there, corroborated, with other additional details, particularly of its use in uterine affections, which induced me to follow up the subject more fully.

The carbonic acid employed there has a small admixture of sulphuretted hydrogen, sufficient to render it very disagreeable to the sense of smell, and to injure the polish of your gold watch or pencil case (should you expose them to its influence, which I was thoughtless enough to do), but which is not believed to exert any therapeutic effect, that being entirely owing to the carbonic acid.

The gas is obtained from the surface of an extensive natural mud deposit, which abounds in the neighbourhood of the establishment. This is constantly boiling and bubbling forth immense volumes of this gas from its miry depths, and a portion of it is covered by a large funnel, which collects and confines the gas as it rises, and which is thence conveyed by a tube into the bath compartment.

This compartment is barrel-shaped, and provided with a seat, and a lid or cover, which fits closely around the neck of the patient, whose trunk and extremities are thus alone exposed to the vapour, which rushes with great force into the compartment against his person, but without being in any way directed to any particular part thereof. While undergoing the operation, therefore, the patient is immersed in a powerful current of the gas, which plays freely over his whole trunk and extremities.

The therapeutic influence, however, is said to be confined to the pelvic viscera, or more particularly to the organs of generation; and the bath has an extensive reputation for the cure of diseases seated in those parts, and in particular, for the removal of certain kinds of sterility, of which many interesting, though perhaps fabulous instances, are related in the ephemeral publications which abound at all such establishments. Much of this must, no doubt, be put down to the spirit of exaggeration too frequently indulged in by the interested writers of those local guides and hand-books; although I have reason to believe, that in this instance they contain a certain amount of truth and fact.

I was, of course, rather sceptical as to its powers of removing sterility, as well as to the more specific effects it was said to exert upon the generative organs in particular, and resolved to put the matter to some simple test; for I was told that its physiological effects even, were marked and palpable to the senses, and of which I could easily persuade myself by experiment. Still, knowing how apt peculiar sensations, and even vascular changes, are to be set up in the human organism, and particularly in these organs, through the medium of suggestion, or by concentrating the attention on them for a given time, I was careful to prevent this source of error, and arranged that two young men of our party, who were entirely ignorant of the reputed effects of the bath, should subject themselves to its influence, requesting them to attend carefully to any peculiar sensations or effects it might produce on them.

After remaining in the bath about fifteen minutes, they described their sensations to be almost identical, viz., that a prickling heat extended over the genital organs, followed by free perspiration and moist exudation from the mucous surfaces. Finding such result from this simple experiment, I was quite prepared to believe that very important therapeutic effects might be obtained by properly guiding and directing the application of this agent in many cases of uterine disease, as well as of many other diseases affecting the organs of generation.

On my return to England, I transmitted a short account of my observations to Dr. Cormack for publication, before leaving for the East; but on account of changes in the management of the journal, the manuscript got overlooked. On again resuming active practice in this place, I resolved to take advantage of this agent wherever I considered it to be indicated, and now firmly believe that I have often obtained most beneficial results from its application.

Of course I had no means of obtaining the supply of gas necessary to produce effects such as I witnessed at Machynlleth, being obliged to generate it in a large bottle, from chalk and sulphuric acid for the quantity and force of the application must have an important effect on the result), so that I only have used it in conjunction with other means; still, I think, that its effects have been highly satisfactory, particularly as an *anæsthetique*, as well as a topical *sedative* in cases accompanied with great heat and irritation of the generative organs.

In such cases, I have carried the gas under the bed-clothes by a flexible tube, directing the stream against the parts affected, and retaining it in contact by arrangement of the clothes as much as possible, keeping up the stream for an hour or two at a time, and often with great relief and comfort to the sufferer.

To conclude, however, I may repeat my belief, that carbonic acid not only exerts generally upon the organism, the sedative, and anæsthetic influence so ably described by Dr. Simpson, but that it *peculiarly* and *specially* acts upon the organs of generation as a

stimulant and sedative, and that both actions may be taken advantage of in the treatment of diseases incidental to these organs, and take this opportunity of directing further attention to this agent as a most useful and promising means of cure.—*Edinburgh Medical Journal, August*, 1856, *p.* 187.

125.—*Ergot of Wheat.*—Dr. JOBERT makes the following statements respecting this substance :—1. The medical and obstetrical property of this ergot is as incontestable as of ergot of rye, and its effects are as prompt, as direct, and as great. Its hæmostatic action appears certain. Dr. Jobert has administered it several times against abundant discharges of blood, and immediately after labour it has almost constantly and fully succeeded. 3. In the dose of one or two grammes, according to urgency, in cases of uterine hemorrhage, during any period of pregnancy, it has frequently succeeded in lessening, if not in completely arresting, the hemorrhage; and this without appearing to produce any stimulant action on the uterus.—*British and Foreign Medical Review, July*, 1856, *p.* 242.

126.—*Glycerine and Tannin in Vaginitis.* By M. DEMARQUAY.—In the treatment of this affection, M. Demarquay has found a composition, consisting of eighty parts of glycerine and twenty of tannin, of great service. When the vaginitis first appears, the inflammatory symptoms should be calmed by appropriate regimen, baths, and frequent emollient injections. When the first stage of the inflammation has passed away, and the careful introduction of the speculum has become possible, abundant injections of water are to be thrown in, so as to remove all the muco-pus which lines the walls of the vagina, and these are then dried by a plug of charpie placed at the end of a long forceps. Then, three plugs of wadding, well soaked in glycerine and tannin, are to be introduced. Next day, after a bath, the plugs are removed, new injections made, and the dressing repeated. M. Demarquay has never had to have recourse to more than four or five such dressings. After discontinuing them astringent injections, consisting of infusion of walnut leaves, in which one drachm of alum to the quart has been dissolved, are employed two or three times a-day for a week or ten days.—*British and Foreign Med. Review, Oct.* 1856, *p.* 549.

127.—ON THE EFFECTS OF BELLADONNA IN ARRESTING THE SECRETION OF MILK.

By Dr. R. H. GOOLDEN, Physician to St. Thomas's Hospital.

[A woman, aged twenty-eight, was admitted into St. Thomas's Hospital with severe rheumatic fever. She had a child at the breast four months old, which, according to the regulations of the hospital, it was

necessary to remove. She was treated as usual for the rheumatism. On the following day the breasts had become tumid, hard, knotty, and extremely tender.]

A milk abscess, in complication with rheumatic fever, was of all things to be avoided, and unless the secretion could be at once arrested it appeared inevitable. In this strait I recollected that I had somewhere met with an observation (but I cannot remember whether it was in an English or foreign journal) that atropine applied externally to the breasts would dry up the milk; and thinking it reasonable, I caused the areola of the breasts to be smeared with extract of belladonna, in the same way that it is used to dilate the pupil of the eye. I likewise ordered the addition of half-drachm doses of colchicum wine, knowing that whenever milch cows eat the meadow saffron in the pasture, they immediately become dry; and though I have not much faith in colchicum as a remedy in rheumatic fever uncomplicated with gout, there could be no objection to its use, and it has the sanction of much higher authority than my own.

On my third visit, the following day, the first inquiry was about the breasts. They were all right. But was it the colchicum or belladonna that had relieved them? The extract was used before I left the ward; before the mixture was given the secretion of milk had been arrested and the breasts had become soft. The rest of the case has no further special interest. I will only state that there was no heart affection, and that the fever, though very severe while it lasted, was of short duration, and the patient left the hospital quite well in fourteen days.

The second case that occurred to me was uncomplicated with any disease, and such as would usually fall under the care of the accoucheur rather than the physician:—

A lady, the wife of a clergyman, was travelling with her husband, and in order to accompany him, had weaned her baby, (then seven months old.) Happening to be at Oxford at the commemoration festival, he came to me in great trouble, telling me that his wife had done a foolish thing in weaning the child, and that they were now arrested in their progress in consequence of the state of her breasts. They were tumid, very tender, painful, and hard, with large superficial veins, and the milk had been drawn with difficulty several times, with temporary relief. I recommended the application of the extract of belladonna to the areolæ, desiring them to send for a medical practitioner if the inconvenience did not immediately subside, or unless she felt quite well. A few days brought me a letter, giving a very satisfactory account, and thanking me for what she was pleased to call my wonderful prescription. Within two hours, she was perfectly relieved, the milk absorbed, and (what is very important) there was no fever or other inconvenience attending the sudden suppression of the milk; and instead of taking the opening medicine I had prescribed for her, she continued her journey the next morning.

I have not been able to discover that the fact that belladonna is available for the purpose of arresting the milk secretion is at all generally known—certainly it was not to several accoucheurs in large practice of whom I have inquired. The fact is important, if true, for then milk abscesses will become a matter of past history, and probably many diseases of the breast may be rendered less complicated by its use.

The two cases I have detailed are not sufficient to prove that it will always be either successful or safe, but they render it highly probable that it is so.—*Lancet, August* 9, 1856, *p.* 176.

128.—ON THE NERVI-MOTOR FUNCTIONS OF THE UTERUS.

By Dr. W. Tyler Smith, Physician-Accoucheur to St. Mary's Hospital.

[It is of immense importance that the nature of uterine muscular action should be well understood, since from its excess or deficiency the most serious cases occur which are ever met with: from excess of action we may notice rupture of the uterus; from deficiency of action, hemorrhage. It is remarkable, that although the gravid uterus is the largest muscle in the body, this subject has not been satisfactorily discussed in any modern work upon obstetrics.]

The uterus is in relation with the Cerebral, Spinal, and Ganglionic divisions of the nervous system, and possesses properties derived from each of these sources of motor power.

In the first place, let us consider the relation of the Cerebral system to uterine motor-action.

The uterus is withdrawn from the direct influence of Volition. The will has no direct power either to contract or to dilate this organ. Labour may take place when cerebral paralysis exists, the will being entirely in abeyance, but the uterine movements dependent on reflex action and peristaltic action, remaining perfect. But though not exerting any direct influence, volition may affect the uterus indirectly. In certain cases of uterine inertia, when the contractions of the uterus have entirely ceased, voluntary efforts are sometimes sufficient to reproduce uterine contractions. Efforts at expiration, with the glottis closed, cause the abdominal muscles to compress the uterus mechanically, and this compression stimulates the uterus in the same way as manual irritation of the organ. What is called in other organs, consensual action, may also probably be excited in the uterus, to some degree, by volition. Violent voluntary action quickens the action of the heart, and the voluntary contraction of the internal rectus muscle contracts the iris, though both the heart and the iris are removed from the direct action of volition. In a similar manner, the uterus, during parturition, is probably affected during the intense efforts at expiration and bearing-down, which accompany the pains of labour.

A very powerful influence may be exerted upon the uterus by Emotion. A fright, or any mental disturbance, may bring on labour prematurely, or produce abortion. During labour, any sudden emotion of the mind may increase or arrest uterine action. The different effects of hope or despair on the commencement, progress, and termination of labour have frequently been remarked. Emotion often plays the part of Tantalus to the accoucheur. His entrance into the lying-in room may arrest the pains of labour for a time, through the influence of emotion, but if he should leave the house they as often return with increased vigour, and terminate the labour abruptly in his absence. After delivery, the maternal emotion exerted by the sight of the infant causes the uterus to contract in a remarkable manner. Emotional, like voluntary action, is psychical in its nature, and originates in the cerebrum; but it acts upon the uterus and other parts through the spinal marrow, the great organ of physical motion. This is evident from the fact that emotional movements may occur in parts which are entirely paralysed to cerebral voluntary motion.

Let us now refer to the forms of uterine action depending upon the Spinal Marrow, a subject which did not admit of comprehension before the brilliant discovery of the spinal system by Dr. Marshall Hall.

The Reflex, Spinal, or Diastaltic action of the uterus is excited in various modes; and it is upon this form of contraction, aided by peristaltic action, and the extra-uterine reflex actions excited during the process, that natural parturition essentially depends. Contraction of the uterus, of a reflex or diastaltic kind, may be excited by irritation of the mammæ, as in the act of suckling the infant; by the impression of cold upon the vulva or abdominal surface; by irritation of the rectum, as by a stimulating enema; by gastric irritation, as in drinking a gulp of cold water, or swallowing a piece of ice; by ovarian excitement, as in the occurrence of abortion from the menstrual nidus; by irritation of the vagina or pressure on the perinæum, and by irritation of the os and cervix uteri. These facts supply the proof that the uterus is endowed with reflex action, and that the motor nerves of the uterus are in relation with the mammary, pubic, rectal, pneumogastric, ovarian, and vaginal nerves, and the nerves of the os and cervix uteri, as incident excitor nerves. There can be no doubt that in an organ thus subject to reflex action, its own nerves are excitors, and that in all contractions of the uterus excited by irritation of the internal surface of the uterus or of the os and cervix during the passage of the fœtus, the uterine actions are both reflex and peristaltic. That the internal surface of the uterus possesses incident spinal nerves, is proved by the occurrence of vomiting, &c., from uterine irritation. There is indeed no instance of a mucous surface wanting the power of exciting reflex action in other parts of the body. It is a question if any pure spinal fibres reach or proceed from the uteras, unmixed with fibres from the ganglionic. This admixture produces a curious effect upon

the reflex contractions of the organ. If we irritate the conjunctiva with a feather, the orbicularis muscle contracts instantly. If we tickle the fauces, efforts at vomiting are immediately produced. But in the case of the uterus, contraction does not follow upon the irritation in so sudden a manner. I have sometimes, in cases of alarming hemorrhage, had my hand in the uterus for a considerable time, and have carefully watched the influence of reflex stimuli upon the uterus. If, while the uterus remains flaccid, cold water is sprinkled upon the face, the uterus does not contract at once, but after an interval of half a minute to a minute, or even longer, the organ slowly begins to contract, reaches its acme by degrees, and as slowly relaxes. The same thing happens if, while the hand remains in utero, cold or iced water be injected into the cavity of the organ.

As a motor organ, the uterus stands alone in many respects. Unlike the rectum and bladder, it is not directly influenced by volition; and unlike the heart, it is extremely prone to reflex action. It more nearly resembles the œsophagus, which is uninfluenced by the will, but is endowed with reflex motion and peristaltic action. It differs, however, from the œsophagus in the number of excitor surfaces with which the spinal system places it in relation. There is no other organ, not even the stomach, which can be excited by so many distinct organs, or which acts as such an extensive excitor of motor action in other parts, both in the impregnated and unimpregnated states, as the uterus.

Besides the reflex action of the spinal marrow, and its system of excitor and motor nerves, there is the direct action of the spinal centre to be considered, though this form of spinal action does not play the important part assigned to it by Serres, Brachet, and Segalas. In what is termed direct or centric spinal action, the spinal centre with its motor nerves are concerned, to the exclusion of the incident or excitor nerves. Various instances of centric spinal action may be given. Thus, ergotine passing into the blood, affects the spinal centre, and its effects reach the uterus by its motor nerves. Other oxytoxic agents, such as strychnia, carbonic acid, savin, aloes, alcohol, the biborate of soda, and probably ipecacuanha, act in a similar manner. The state of the circulation affects the spinal centre in a very distinct manner. It is well known that there is one form of puerperal convulsion depending upon hemorrhage, where the heart and great vessels have been nearly emptied of blood, and another caused by fulness of circulation. The convulsion probably depends greatly upon the influence of deficiency or excess of blood in the vessels of the nervous centres. Want or excess of blood, or materies morbi in the circulation, act, then, as direct stimuli to the spinal centre, and in this way the state of the circulation affects the uterus during labour. The uterus acts with increased force when the circulation is either plethoric or anæmic; though in the latter case, exhaustion of its nervous energy quickly ensues.

We now come to the consideration of peristaltic action, or ganglionic motor action.

When any part of the muscular organ supplied in whole or in part by the ganglionic system of nerves is irritated, the contraction which ensues generally spreads in a vermicular manner to a distance from the point of irritation, and continues for some time after the exciting cause is removed. This is called peristaltic motion or action. The uterus is eminently endowed with this peristaltic form of contraction. When one point of the uterus is stimulated, through the abdominal parietes, or by the introduction of the hand into the uterus, the contraction excited extends to the whole organ. Harvey described this peristaltic action of the uterus in the doe. William Hunter saw it in the cat and the rabbit. Müller observed it in the uterus of the rat and the oviduct of the turtle; and I have seen it in the uterus of the guinea-pig and other animals. The heart, œsophagus, and intestine may be excited to contraction after death; and I have seen the uterus and vagina of the rabbit contract rymthmically, when irritated, for several hours after the cessation of respiration. Many cases are on record in which women have died undelivered, but the child has been expelled spontaneously after death. In one case, a woman dying during labour was placed in a coffin, and the fœtus was found next day perfectly expelled, This post-mortem parturition must generally depend upon peristaltic action, commencing after the occurrence of somatic death, or upon the rigor mortis affecting the uterus. It is well known that the rigor mortis affects the other involuntary muscles, and especially the heart, which is contracted by this influence to such an extent as to empty the ventricles, and even to simulate concentric hypertrophy. Cases are related in which the fœtus has apparently been expelled some days after the death of the mother by the gaseous distension of the abdomen; but these are different from cases occurring shortly after death, and before decomposition has set in. In the living subject, the peristaltic action of the uterus is the basis of the other uterine actions. In natural labour, it is combined with reflex uterine action, and with various forms of extra-uterine action; but, under certain circumstances, it seems able to effect the expulsion of the child without other aid. In paraplegia from disease of the lower part of the spinal marrow, or in animals reduced to the same state by experiment, the peristaltic action is the chief power remaining to the uterus. In such cases, delivery has been effected in an imperfect manner by the peristaltic action of the uterus, or the application of galvanism to the organ. It is not, however, known how much of the spinal marrow must be destroyed before the reflex or diastaltic actions of the uterus cease.

Certain experiments have been performed by various physiologists, with a view to determine the nature of uterine action. M. Serres found that on dividing the spinal cord in gravid animals before the time of parturition, death ensued at variable intervals, but abortion

did not necessarily occur. He then divided the cord in animals after the commencement of parturition, and the process was arrested. In other experiments, he excited abortion in animals by irritating the spinal marrow in the lumbar region. M. Brachet divided the cord in guinea-pigs between the twelfth and thirteenth dorsal vertebræ, after the commencement of labour, and everything but feeble contractions of the uterus were arrested, the animals dying in a few days undelivered. M. Segalas made a section of the cord high up, without influencing the uterus; but the organ was paralysed when the division was practised low down. Cases are detailed by MM. Brachet and Ollivier, as occurring in the human subject, in which, in paralysis depending upon disease high up in the spinal marrow, uterine action was not interfered with, but was diminished or suspended altogether in cases of paraplegia, the result of injury or disease, low down in the cord. Dr. Simpson has, I have understood, performed some experiments upon pigs which go to negative the experiments of MM. Serres, Brachet, and Segalas. In Dr. Simpson's experiments, which have not been published, I believe parturition occurred notwithstanding the destruction of the lower portion of the spinal marrow. If Dr. Simpson's results are as I have stated, they will not prove the independence of the uterus of reflex action, since from the connections of the greater and lesser splanchnic nerves and the thoracic, abdominal, and pelvic plexuses and ganglia, it is quite possible that the uterus may receive spinal fibres from the upper part of the spinal marrow.

The direction taken by the peristaltic action is of considerable importance. Professor Müller, Michaelis, and Wigand, teach that uterine contraction commences at the cervix, and travels towards the fundus, returning thence towards the os uteri. This is thought by Michaelis to prevent prolapsus of the umbilical cord, and the descent of the arms of the fœtus before the head; the cord and the arm, when lying low in the uterus, being swept upwards, beyond the risk of danger, at the commencement of every pain. Wigand considers the direction of the contraction to be proved by the phenomena attending a labour-pain. At first the os uteri grows tense, the head or presenting part recedes from the touch, and the bladder of membranes protrudes; after this, the fundus uteri becomes hard, and the presenting part of the child begins to advance. I believe this view of Wigand, which has been particularly insisted upon by Dr. Rigby, to be a very accurate description of the direction in which the uterus contracts during a labour-pain.

If, as is most probable, the peristaltic action of the uterus does take this course, it is not singular, for, according to the observations of Magendie, the contents of the stomach are, during digestion, passed through the pylorus by a peristaltic movement; which begins at the pylorus, proceeds to the cardia, and then sweeps back again from left to right. Müller also describes the contraction of the heart of the frog as commencing in the venous trunks; then descending,

in succession to the auricles and ventricles; and then affecting the bulbus aortæ. The peristaltic action commences at the auricle, travels to the apex, and then returns towards the base of the ventricle. There seem good reasons for the commencement of the peristaltic action at the cervix in the human subject, in the necessity which exists for some provision against prolapsus of the cord, and arm-presentations; and still more, from the great probability that, if contractions commenced at the fundus uteri, inversion of the organ would be a frequent accident.

In addition to the divers forms of uterine contraction, the dilatation of the os and cervix uteri remain to be considered. The dilatation of the os uteri is, in part, mechanical or passive, depending on the contraction of the longitudinal fibres of the uterus, which tend to pull the os uteri open, and also on the fluid pressure exerted by the liquor amnii on the advancing head of the fœtus. But in addition to the mechanical distension, the os uteri is in part opened by an active mechanical dilatation. The presence of a power of dilatation in the os uteri is not more remarkable than its power of contraction after the completion of labour. We have seen that the os uteri contains numerous fibres arranged in a circular form. But the muscular fibres of the uterus, though of considerable length, do not at any point surround the organ, either in the body or at the os or cervix. This circular arrangement of the fibres, without the existence of single fibres sufficiently long to surround the os uteri, accounts for its power of contraction and dilatation. Before the commencement of labour in primipara, the os uteri is quite closed; while in parturition it is dilated to such an extent as to permit the passage of the child's head —a mass whose shortest diameter is three inches and a half, making the line of the circle necessary for its passage, nearly eleven inches. This is a dilatation far exceeding that required in the action of any of the recognised sphincters, and we cannot but believe that if completely circular fibres existed at the os uteri, laceration would be inevitable.

Some of the physiological proofs of the possession of dilatile and contractile powers by the os and cervix uteri may be enumerated, and these proofs are not less convincing than the most certain anatomical evidence. In the first place, if the fibres of the cervix contracted with the same force as the fibres in the rest of the uterus, this organ could scarcely be emptied of its contents. Doubtless the contractions of the body and fundus uteri are strong, their bearing upon the cervix powerful, and the amniotic bag admirably adapted for mechanical distention; but it must be remembered that the short fibres of the cervix act at a great mechanical advantage, as compared with the fibres in any other district of the uterus. Let any one who supposes the body and the fundus may forcibly overcome a contracted state of the os and cervix, consider that the united power of all the respiratory muscles is insufficient to force the small muscles which close the

glottis. The nature of the hemorrhage in placenta prævia, as compared with hemorrhage from the fundus, affords the strongest argument in favour of a positive dilatation of the os uteri. In hemorrhage from the fundus, the loss of blood is arrested during a pain, because the fundus is in a state of contraction; in hemorrhage from the os and cervix, the flow is increased at each return of the pains, because the cervix is in a state of dilatation. If the dilatation were merely a mechanical distention, the pressure which dilated the os uteri would arrest the hemorrhage at the same time.

Owing to the mixed mechanical and muscular dilatation of the os uteri, it generally opens slowly; cases, however, occur, in which, after long-continued rigidity, it dilates so suddenly, that even from this fact alone it is difficult to consider it a mere mechanical distention, the resiliency of the part affecting its subsequent contraction. But the strongest physiological proof of the existence of muscular power in the os and cervix uteri is the forcible contraction which sometimes occurs after full dilitation—as, for instance, in cases of encysted placenta, in which the fingers can only be introduced with the greatest difficulty; and again, in inversio uteri, where the speedy and powerful contraction of the cervix is one of the elements of the accidents most opposed to the re-position of the organ.—*Lancet, April* 26, 1856, *p.* 445.

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MISCELLANEOUS SUBJECTS.

129.—ON FÆCAL FERMENTATION AS A SOURCE OF DISEASE.

By Dr. C. H. F. Routh, (Read before the Medical Society of London.)

[Dr. Routh enters upon the consideration of the effects of fæcal fermentation, in solution or suspension, in the production of particular diseases.]

Cholera. It is not my intention to dwell at great length on the subject of the spread of cholera by water impregnated with choleraic dejections. I conceive it is now generally admitted by all that cholera is most prevalent and fatal in the course of large rivers, and where the water supply is bad. Dr. Snow's work is full of examples on this point. I shall take from this work only three such examples, those of Newcastle-on-Tyne, Golden Square, and Lambeth.

Newcastle and Gateshead. The following table exhibits the mortality from cholera in the periods 1831-2, 1849, and 1853:—

Newcastle.

Year.	Actual mortality.	Population.	Deaths to 10,000 population.	Remarks.
1831-2	801	42,760	187	No water works.
1849	295	71,847	41	Good water supplied.
1853	1533	86,114	178	Bad water supplied.

Gateshead.

1849	Comparative immunity			Water works and water good.
1853	433	26,000	166	Bad water.

Both Newcastle and Gateshead are supplied by the same water company. Previously to 1832, there were no water works; subsequently, these were made, and water was obtained from the Tyne, about a mile above the town, although the tide flows six miles above the town. In 1848 these waterworks were abandoned, and excellent water was supplied from a small stream ten miles above Newcastle, called Whittle Dean. In 1853, the water from Whittle Dean being insufficient for the wants of the town, the original water works of 1832 were reopened, and thus bad water mixed with the good, so bad as to contain 7·1 parts of organic matter per gallon. (Dr. Thompson says at its origin there was 15·6 total impurities, of which 4·5 were mechanical, 2·68 organic in solution, and 8·48 organic impurity.) Thus, according as the water supply was good or bad, so the mortality from cholera was low or high.

Again, the greater number of deaths, viz., 1011 out of 1553, occurred at Newcastle from 13th to 23rd September, inclusive. The reason was this. Owing to the outcry, the company supplied, after the 15th, no more Tyne water; and although the Tyne water was not out of the pipes till the end of a day or two, the deaths decreased from the 19th.

Sept. 12th	38	Sept. 18th	103
„ 13th	59	„ 19th	111
„ 14th	90	„ 20th	85
„ 15th	106	„ 21st	68
„ 16th	114	„ 22nd	82
„ 17th	103	„ 23rd	60
	510		509

It is also to be remarked that places supplied with pump water, and not with that of the company, at most suffered from simple diarrhœa, and not from cholera. Thus, in the workhouse, supplied by the company, out of 440 inmates, the number of deaths was 7 out of 12 cases of cholera. In the barracks, with 590 inmates, and in Greenhow Terrace, supplied by wells, there was no cholera, only diarrhœa. (See Dr. Snow's work.)

South London District. This district was supplied with water from two sources, the Lambeth Company and the Southwark and Vauxhall Company. In 1849 the former company got its water from the Thames, near Hungerford Market; the Southwark and Vauxhall from the same river, near Battersea fields. In 1854 the water of the latter company was obtained from the same place, while the former procured it from Thames Ditton. In 1849 the mortality was nearly the same in the districts supplied by each company. In 1853, the deaths were, in those parts supplied by the Southwark and Vauxhall Company, 525; while only 94 occurred in those supplied by the Lambeth Company, and 33 in those districts supplied from pump wells, and other sources. This mortality being divided over two periods, the first four weeks give 286 cases against the Vauxhall Company to 14 against the Lambeth; while, for the remaining three weeks, the deaths were in the proportion of 8 against the former to 1 against the latter. In the General Report of the Board of Health, speaking of the supply of water in London, is the following paragraph: "Those supplied by the Southwark and Vauxhall and Chelsea Companies greatly surpass the others in badness. In the Southwark and Vauxhall water, the evidence of unfiltered contamination reaches its highest degree, revealing to the microscope not only swarms of infusorial life, *but particles of undigested food, referable to the discharges from human bowels.*" And it is this last contamination which propagates especially the disease, and which is plentifully supplied by the admixture of sewage matter.

Golden Square. The last example to which I shall allude is that afforded by the Golden Square tragedy. As Dr. Snow remarks, "The

mortality in this limited area (*i.e.*, within two hundred and fifty yards of the spot where Cambridge Street joins Broad Street) probably equals any that was ever caused in this country, and it was much more sudden, as the greater number of cases terminated in a few hours." Upwards of five hundred deaths occurred in ten days. I cannot follow the history of the cases, which have been so ably drawn up by Dr. Snow. I can only allude to a few points. The outbreak commenced on the night between the 31st August and September 1st, and was to be traced to the drinking of water from a particular pump in Broad Street. In the subdistrict of Golden Square, Berwick Street, and St. Ann's, Soho, the deaths registered for the week ending September 2nd were 6 in the first four days, 4 on Thursday 21st, and 79 on Friday and Saturday 22nd and 23rd. Into those occurring in these last three days, 83 in all, Dr. Snow made close inquiry. In 65 of these cases the patients had all partaken of the pump water. In a coffee-shop in the neighbourhood, frequented by mechanics, and supplied with this water at their dinner, by the 6th of September ten of its frequenters had died of cholera. It was partaken of by a gentleman and his brother in Poland Street, both of whom died. It was partaken of by a lady and her niece, living at Hampstead, who sent daily for this water from preference, and both died of cholera. Two remarkable instances of comparative exemption in the same locality of persons not partaking of this, but of other water, prove the same truth conversely. In the workhouse in Poland Street, out of 530 inmates, only 5 had cholera; the other cases of cholera were brought from without. Here the Broad Street pump water was never partaken of; but there was a well on the premises, besides a supply of water obtained from the Grand Junction Water Works. Secondly, in the brewery in Broad Street, out of 70 workmen employed, only two had slight attacks of cholera. The reason was, they drank little or no water, but malt liquor, and, besides, there was a well on the premises. The pump water was, then, the cause of this cholera: and it has now been shown that, on the day preceding the outbreak, a boy had had cholera in an opposite house, the water closet pipe of which passed about three feet from the well pipe, that the mortar work between the two pipes was defective, and that thus there was a communication allowing admixture of their contents.

So far, therefore, as these facts go, they appear to show that the choleraic matters in solution in water do communicate the disease. But the mass of other evidence in the same direction, recorded by Dr. Snow, has proved this to demonstration. The immediate poison being a ferment, hitherto undiscoverable, because too minute even for the most powerful microscope of the day. Dr. Snow calls it a cholera cell; but, after all, the action of this cell is the same as that of a ferment. It is a distinction of words without a difference in meaning.

The examinations of waters in choleraic seasons may be thus detailed, and I have adopted a tabular form especially, as bringing

the points of difference between the water from our companies, or from wells or pumps, more saliently forward.

Water Companies.	*Pump Water or Wells.*
1. Contained organic matter, dead and living, annelida, entomostraca, infusoria, confervæ, dromidaceæ, diatomaceæ, *fungi*, hairs of animals, starchy matter, dead and decaying fragments of vegetable tissue.	1. The same, excepting hairs and starchy matter, among most wells. But *deep* wells, and spring water, were remarkably free from organic matter. In some there was total absence. In a few, as Wadden water, and Painham water, there were a few confervæ, dromidaceæ, and diatomaceæ, but no *fungi*.
2. No animal peculiar to cholera was found. One kind only gave room for suspicion, but it has been found since in harmless waters, viz., a brown, *fat*, *lenticular*, moving spiral-like body.	2. *Ibid.* This body was also found in the Golden Square pump water.
3. Vibriones also abound.	3. The same.
4. The purest of the metropolitan was that of the Lambeth Water Company; the impurest was that of the Southwark and Vauxhall. In the latter there were visible quantities of fæcal matters.	4. In some sewage matter was found. In the water of two pumps, especially in Putney—in Price's Folly and Creek Buildings.
5. In some of the water of the Southwark and Vauxhall, Lambeth, and West Middlesex Companies, animalcules were found, which exist only in brackish waters, showing admixture of sea water, viz., the tritrychia, trigma, melosura, nemuloides, and coscinodiscus eccentricus.	5. Not found.

Typhus and Typhoid Fever.—These are two diseases which have for centuries infected this country, and which may, I fear, be traced to a similar origin—cesspool water. In proof of this, I shall first adduce the example of the fever at Hastings, which I before detailed to the society. The first case occurred in a large room in the uppermost story of one of the largest and best ventilated houses in St. Leonard's, on the Hastings side. There does not appear to have been any other cases of typhus in the place before, and I am also bound to add that this patient had not, so far as could be collected from inquiry in this point, been exposed to typhoid contagion. In this house, however, a

woman—the cook to the family, and the inhabitant of this upper room—was seized with fever, which soon passed into malignant typhus. Owing to insufficient attendance, and by reason of the water-closet being placed two stories lower down, the evacuations from this woman's bowels, which were fearfully offensive, were frequently retained in the room for nearly a whole day before removal. The crisis in this fever was, in fact, a copious diarrhœa, during which the pulse fell from about 160 to 90 in the course of a few hours. Six persons who were living in that house caught the fever, and one gentleman died. All had feverish symptoms, accompanied with copious vomitings; though, in some, the disease fortunately stopped there. I learnt, subsequently, that after the house had been purified, two new visitors, who took the lower rooms, were also seized with fever. The origin of the disease was traced to a direct communication between the cistern of the water drunk by the inmates and the pipe from the water-closet. As the house was beautifully ventilated, and there was no communication between many of those who caught the fever, it is most probable that the disease was produced in the sick by the drinking of the polluted water. A similar result has been observed in other cases of typhus. My information, however, on this subject is necessarily meagre. I applied to Dr. Corrigan, of Dublin, to know whether such an effect had ever been noticed in the Richmond Fever Hospital. "In a fever hospital," he remarks, "there is such cleanliness observed, that there is little exposure to the action of fæces, and the purity of the water supplied would certainly give no room for this source of contagion." The Croydon typhoid fever, which proved so fatal, was due to the water being impregnated with drains of a very fœtid character. This fact has been equally dwelt upon by Drs. Snow and Richardson. Croydon is gravelly in its soil, and thus porous to the transudation of liquid matters. The place, moreover, like most country places, abounds with cesspools. Up to the beginning of 1852 the water supplied was obtained from shallow wells and stagnant ponds. In 1852 these were abandoned, and the water supplied from a deep well, dug fifty feet in the chalk, worked by a steam-engine. Towards the end of 1852, this supply was interfered with, owing to the new drainage works established by the Board of Health; the inhabitants had recourse to the old pumps, wells, and ponds, the former contaminated with cesspool matters, and the result was a virulent epidemic of typhoid fever. In the following account of an epidemic quoted by Dr. Jenner in his Gulstonian lectures, the same origin probably existed. The facts are given on the authority of Dr. Hunt, of Buffalo.

At North Boston, Erie County, U.S., in 1843, resided nine families. Taking a tavern for the centre, seven of the nine lived within an area of one hundred rods in diameter. All the inhabitants, with the exception of the members of one family, were in the habit of frequenting the tavern. A feud existed between the master of that one and

the tavern-keeper. A man labouring under typhoid fever—a disease previously unknown at North Boston—took up his residence at the tavern September 21st, and died October 29th. Between October 19th and December 7th, twenty-eight persons in this little community had typhoid fever. Three families only escaped the disease, viz., the two residing the farthest from the tavern, and that of the man who had a quarrel with the tavern-keeper, and, consequently, never visited at his house. Now, a fact of interest in this case is, that all the families in which the disease appeared drew their supply of water from the well of the tavern, while two out of three that escaped had their water from other sources. The man at feud with the tavern-keeper was accused of having poisoned the well of the tavern. He resided nearer than any of the others to the tavern. None who visited the village simply for the purpose of rendering assistance to the inhabitants contracted the disease. (Gulstonian Lectures by Dr. Jenner, 'Medical Times,' March 12th, 1853, p. 26.)

It is true in this case, the necessary link, that the first patient's fæcal matters had been mixed with the well water, is wanting; and yet it seems to afford a probable explanation. Moreover, when we consider that the well and the cesspool are generally, in country places, in the same yard, and often close to one another, the admixture may sometimes occur through a porous soil, and in this manner occasionally explain the occurrence and spread of disease. Dr. Sutherland remarks, "Much of the evil resulting from the close proximity of rivers and canals proceeds from the infiltration of the subsoil, and not merely from the aqueous vapour, which rises from the surface of the water itself." Speaking, moreover, of the Thames, he says, "Besides the evil resulting from imperfect declivity, the sewers are back watered at high tide, and actually become the means of distributing a polluted and unwholesome drainage through all their ramifications, by which the whole subsoil becomes infiltrated with impurities." It is also clear that any imperfection in a sewer, a broken brick, for instance, in connexion with a similar imperfection in a pump close by, may lead to the drinking of contaminated water by a whole neighbourhood. Now, I have remarked that such waters may lose all smell, and even appear to be quite clear, and yet be poisonous from matters held in solution. I remember the example of the common sewer of Fontainebleau, which passes through the park, which is of a gravelly and rocky soil, and which, at times, after about half a mile's course as a rivulet, is in appearance perfectly clear, limpid, and inoffensive in odour.

The same fact is mentioned by the Committee on Dysentery of the American Medical Association (vol. x. p. 568). Speaking of Seconsia, in Calhoun County, it is remarked that the water in the streams was very low, emitting an unusual smell from a quantity of decayed fish having been thrown in it in July. A long time after *men* ceased to detect any offensive odour in it, some *horses* would not drink of it below

the bridge, but hurried above it, and drank heartily of the stream there. The first case of dysentery occurred in this neighbourhood. Mr. Foote, in Drs. Arnott and Kaye's *Report on the Sanitary Condition of the Labouring Classes in and about the Metropolis*, remarks, "Two years ago a fever raged at Red Hill, which I attributed to the lodgment of the filth from privies, which I had removed at the time; the same thing occurred also at the Hyde, the fever prevailing there being of the typhoid type. Again, another medical officer writes that fever has been most prevalent in those courts and alleys where there is no free circulation of air, such, for instance, as Rosemary-lane, in which there are about twenty houses, in almost every one of which fever prevailed. The disease first made its appearance there in the month of August last; and, on my first visit, I found the intolerable nuisance of the overflowing of a cesspool, or privy, which continued for some time, there being no sewer to carry off the soil." Now, a very little reflection explains how a sudden shower of rain would cause these fæcal matters to be carried down in the neighbourhood of wells, so that a very contaminated and impure water came to be drunk, through which fæcal matters might be absorbed on the system. Such may also be the case in Munich.—*Association Medical Journal, Sept.* 6, 1856, *p.* 762.

130.—THE PNEUM-ENEME.

This newly-invented enema apparatus consists of a bottle, in the metallic lid of which are two orifices—one for receiving the commencement of the enema-tube; and the other, about an inch and a half in diameter, for having screwed upon it a "pump," or rather bellows, upon the action of which the utility of the invention depends. The bottle contains a metallic pipe connected with the orifice beneath the enema-tube, and extending to within a very short distance from the bottom of the vessel. The bottle is filled to the extent required with the injection to be used, and the "air-pump," a small and easily manageable instrument, is then screwed on. This "pump" is about three inches in height, and consists of a chamber surrounded with an elastic spring, and having a hole at its summit to admit the external air, and one at the base for its admission into the bottle—the latter orifice being provided on its under side with a valve. The tube with the injection-pipe having been adjusted, by pressing down the top of the pump, which may be done readily by the power of one or two fingers, a quantity of air is forced into the bottle, and an equal bulk of the injection is impelled through the metallic pipe and the enema-tube, the air being prevented from regurgitating into the pump by the valve placed beneath the latter. As the pump springs up again by reason of its elastic sides, it of course refills with air from the orifice at its summit. By pressing the pump repeatedly and briskly at the rate of three or four times in a second, a jet of water may be made

to rise in a continuous stream to the height of fifteen or eighteen inches; and by pressure at the rate of one or two strokes in a second, the jet may be made to rise perpendicularly to the height of a foot.—also continuously, and not in jerks.—which is considered by the inventor a great advantage. The tubes may of necessity vary in diameter and length, but they always work with more facility when they are furnished with ball-and-socket joints. This little machine is remarkable for its simplicity and power.

It is understood that the Pneum-eneme, which is patented, has been devised by Mr. Julius Jeffcrys, the ingenious inventor of the respirators; but we are authorized to state that the inventor has no intention of being in future in any way concerned in its manufacture. The specimen sent to us for examination is one of a most finished kind, and has a good leathern case with a lock. Doubtless, however, it could from its simplicity be produced at a very moderate price. It promises to be an exceedingly useful instrument.—*Lancet, May* 10, 1856, *p.* 518.

131.—CONTRIBUTIONS TO SURGICAL ANATOMY AND OPERATIVE SURGERY.

By Dr. R. Knox, Lecturer on Anatomy, and Corresponding Member of the Imperial Academy of Medicine of France.

Before the young surgeon ventures to operate on the living body, it is presumed that he has acquired, in the practical rooms of an anatomical school, such a knowledge of the use of instruments, and of the mode of performing the various operations, as to render many general remarks on such matters unnecessary. The surgeon ought, in fact, to be *familiar* with the use of surgical instruments—the forceps, aneurism needle, the common needle, scissors, saws, and knives of all shapes. So late as 1821, French surgeons had no scalpels, and we in Britain no bistouries. Take care that you are provided with both, in order to meet every emergency. For want of a common short-bladed scalpel, I saw a French surgeon of the highest eminence (M. Roux) baffled in performing so simple an operation as paring the edges of a perineal fistula; he had no other instrument but the long sharp-pointed French bistoury, with which he tried first in one posture and then in another to pare the edges of the fistula: it was a ludicrous failure.

Prior to any operation, however trifling it may seem, consider carefully its probable results. Observe the constitution of your patient; for there are some persons who cannot support operations, though aided by etherization. It is especially in public hospitals, infected generally with an unwholesome atmosphere, that all operations, not urgently called for, should be scrupulously avoided.

Whilst observing the practice of Messrs. Boyer and Roux, in the Hospital La Charité, Paris, the following case came under my notice:—

Case 1.—A young married woman, extremely beautiful, entered the hospital in order to have a small tumour removed. The tumour was situated at the root of the nose, and close to the eyebrow. She fancied that it marred her beauty, and might grow larger. In an evil hour for her, M. Boyer operated. The operation was clumsily performed, for the celebrated surgeon was now an aged man. The sac was punctured instead of being removed entire. It was, therefore, laid open, its atheromatous contents evacuated, and the cavity stuffed with *charpie*. Severe typhoid symptoms appeared next day, and in three days more this beautiful woman was a corpse. It was said that she caught the typhus in the hospital, and that the operation had nothing to do with her death.

I have my doubts; but the plain facts are just as I have narrated them. In England, *at that time*, the typhoid symptoms would have been ascribed to her own constitution, and not to the presence of typhus *in the ward*. Be distrustful of medical and surgical theories, however distinguished their inventors may be. One of the first patients I saw in St. Bartholomew's Hospital, where I studied surgery, was a stout man, with a compound fracture of the leg. He had all the symptoms of a most intense typhus. Mr. Abernethy remarked, that were a physician to see the patient without being told of the fracture, he would say at once that the case was one of typhus. I confess that even then such was my opinion. Typhoid patients were in the hospital—I rather think, in the ward. But be this as it may, you cannot be too distrustful of medical and surgical theories.

Even in private practice, aided by all the advantages which comfort, wealth, and healthy apartments can give, surgical operations should not be rashly proposed merely to improve the appearance of the individual.

Case 2.—When Mr. Liston was rising into reputation as an operative surgeon, it was but too natural for him to urge operations on some who ought never to have been subjected to them. Amongst the victims of such unfortunate advice was a gentleman of rank and fortune. He had been annoyed for some time by the growth of a small bony tumour connected with the head of the fibula, and so situated as to be conspicuous above the edge of the hunting boots he occasionally wore. This gentleman, in the prime of life and health, was unfortunately recommended to have the tumour removed by a surgical operation, which was described to him as simple, safe, and of easy execution. Accordingly, the head of the fibula, and a part of the shaft involved by the tumour, were boldly removed by Mr. Liston. Severe and oft-repeated bleeding took place; and the surgeon failed in his attempt to secure the vessels. It was next proposed to remove the limb; but to this the unhappy gentleman objected. Death terminated his sufferings in a few days. Such cases are still far too numerous.

It occasionally happens that for some months continuously the air of an hospital exercises so pernicious an influence over the health of its

inmates that no case operated on recovers. The hospital becomes, then, a slaughter-house, which ought, temporarily at least, to be closed. The mortality in general hospitals after battles is so terrible to behold, that I feel convinced that it would be preferable to tend the wounded in the open field. Under all circumstances, hospitals, whether civil or military, are great evils submitted to by mankind, to avoid still greater.

As regards hospitals and hospital practice, the young surgeon will do well not to be especially biassed in favour of what he has seen practised there, nor to place unweening confidence in any name, however eminent. Self-sufficiency, easy to acquire, but with difficulty laid aside, is a serious drawback to character, whether individual or national. I remember the amazement I felt on first visiting a military German hospital, contrasting it with the clean, orderly, model-like wards of an English military hospital, similarly situated. Here all was still, mute, quiet; everything in its place. There all was confusion, noise, disorder; the men were smoking, drinking, talking, laughing, and amusing themselves; their clothes lay about in piles; it was liberty hall. Educated amongst a people fond of "models," I looked with a pity on "these foreigners," and agreed with the staff-surgeon, also a model Peninsular man, who accompanied me in the visit, that these wards resembled pigsties. But a larger experience has shown me the evil results of our "admirable model systems" and of our self-sufficient dogmatisms. From these pigsties, as we were pleased to term them, the wounded escaped alive in a much greater proportion than from our "model wards." I am no advocate for filth or neglect; but freedom from restraint is a great good, whether within the walls of an hospital or without. We fancied also that *our* practice was, of course, the best; but the Russian surgeons appealed to statistics, and showed that of the wounded we lost two for their one. I shall return to this when speaking of the results of amputations, &c.

Never depute your duties to another, and weigh carefully the probable results before taking up the knife or scissors.

Case 3.—A young surgeon, placed on board ship in charge of troops proceeding to a distant colony, was called on to attend the cabin-boy of the vessel, to whom an accident had happened. It was this. In descending the ship's side into a boat, he fell on a boat-hook, which lacerated the ham, tearing up the skin extensively. Instead of replacing carefully the large flap thus caused, he cut it off with a pair of scissors. Fever supervened next day, and the poor boy was reported to the surgeon to be very ill. He (the surgeon), did not trouble himself to visit the boy, but desired his orderly sergeant to give him a dose of calomel. The sergeant mistook the phial, and gave him for calomel a dose of corrosive sublimate. The patient died shortly afterwards in frightful agony.

Were such occurrences frequent, it would be a fair object of inquiry with any community, whether the practice of an art so conducted ought not to be suppressed.

Occupying the first place in the thoughts of the surgeon should be the question of diagnosis. To be skilful in this marks the true surgeon. Whilst a student, I had the benefit of observing for some time the clinique of two physicians, one of whom was never right in his diagnosis; the other never wrong. I soon attached myself to the latter; my fellow-students followed the former in troops. They gave as a reason that he was an active practitioner, and used to prescribe twelve or fourteen different medicines to be taken in the twenty-four hours. The physician I preferred, having no faith in drugs, scarcely prescribed anything. I recommend the young surgeon rather to imitate the latter than the former; he cannot be too careful that his diagnosis be correct. A blundering surgeon benefits, it is true, a public hospital by adding to the accidents occurring out of doors and brought into the hospital a fair amount of in-door accidents occurring in the wards, but it is apt to give the person and the hospital a reputation not to be envied.

The revival of the use of anæsthetics or soporifics is an event of yesterday, as it were. They are now very generally employed, and surgeons prefer, I think, chloroform to every other. By its use the sense of pain is deadened or destroyed. Where hemorrhage is not dreaded, a draught of good wine is the best anæsthetic; but this may safely be left to the choice of the patient. Should he prefer chloroform, the simpler the mode of application the better. A small quantity of the liquid applied to the nostrils by means of a handkerchief is the safest method of using chlorhform. It not unfrequently happens that death follows its use, and therefore the surgeon will do well never to press it on his patient.

An operation cannot be performed too rapidly, if safely. Mr. John Bell, the greatest surgeon of modern times, never threw away an instant during his operations.

Case 4.—A gentleman consulted Mr. Bell for a fistula of the rectum, opening externally. The surgeon examined the fistula, not with a probe, but with a probe-pointed bistoury, and having ascertained that it was a simple uncomplicated fistula, he completed the examination by dividing the sphincter as he withdrew the instrument. On recovering from the momentary pang caused by the incision, the gentleman inquired of Mr. Bell when it would be convenient for him to perform the operation? The answer was, "It is already done."

Systematic writers on Surgical Anatomy and Operative Surgery usually devote a considerable section of their works to what they term "simple operations," practised indifferently on all, or nearly all parts of the body; such as division, cauterization, compression, dilatation, extraction, reduction, reunion, &c. But it seems to me superfluous to speak of such operations at any length. The student can only acquire a knowledge of them by seeing them put in practice by others, and by practising them himself. The reunion of divided parts by nee-

dles, stitches, adhesive and other plasters; the reduction of dislocations; the extraction of foreign bodies; dilatation by means of the fingers or by instruments; the application of the heated iron; compression by bandages; and division with the knife or scissors, constitute nearly the whole of the surgeon's manipulative education. Should he neglect practising it on the dead, he will have to learn it on the living; sometimes at his own cost, sometimes at that of his patients.

In the selection of instruments the young surgeon should follow the example of the best operators of his day, selecting the form they prefer. Let him remember always that an operation is not a dissection, but a series of incisions and steps taken agreeable to a plan previously laid down towards accomplishing a clearly understood object. Where the fingers can be used, they are preferable to knives or forceps. Never press on inflamed or suppurating parts, lest the pressure cause sloughing. To employ caustics advantageously merely requires judgment and a little dexterity. Rust, of Vienna, made the actual cautery fashionable for a time, and with Baron Larrey the moxa was a universal remedy. A sounder pathology has greatly diminished the frequency of appeal to these violent remedies. Nevertheless they are of easy application, and prove sometimes successful.

Hemorrhage is the accident which the surgeon most dreads, whether occurring in consequence of accidental wounds, or caused by operations. In whatever way it happens, the surgeon must look carefully to it, and ascertain its source. Be in no hurry, but lose no time. If the bleeding come from a vessel of any appreciable size, seize it carefully and steadily with the forceps used in dissection, and request an assistant to place a ligature around the vessel, *clear of the points of the forceps*. If the bleeding come from a vessel or vessels which cannot be discovered, the surface may be exposed for some time to the air, or moistened with cold water and vinegar, or a thin linen rag dipped in these, and kept moist, may be laid over the part. Occasionally simple pressure applied for a time by the fingers of an assistant will arrest a hemorrhage: the elevation of the limb, should the bleeding occur there, is at times very successful. Other means for arresting hemorrhage occurring from the division of small vessels have been recommended, such as torsion or twisting, which may be done with the common forceps, touching the part with lunar caustic, applying turpentine, tincture of the muriate of iron, &c. I have followed Mr. Abernethy's mode of treating certain hemorrhages with marked success.

Case 5.—Of the French wounded on the 18th of June, 1815, some were brought into Brussels, and placed in churches and barracks, used temporarily as hospitals. The hospital called Gendarmerie was at first filled wholly with the French wounded. The wards of the 1st Division fell to my charge. In one of the adjoining wards a staff-surgeon, searching for secondary sequestra of the thigh bone, conse-

quent on gun-shot fractures, divided with the knife some large branches of the external circumflex artery of the thigh. He left the patient in charge of an assistant, directing him merely to apply pressure to the part. In a short time a message came from the assistant to say that the hemorrhage could not be controlled. The staff-surgeon requested me to see what was the matter. It was this: the assistant, alarmed, had piled lint and cloths alternately over the wound, and over these a tourniquet, and the larger the pile of rags grew the hemorrhage increased the more. Knowing from what Mr. Abernethy had told me, that such ineffectual efforts to restrain hemorrhage merely add to its strength, I removed all the dressings, bandages, &c., exposed the surface freely to the air, and thereafter placed over it, loosely, a thin linen rag moistened with vinegar, directing the heel to be raised, and the patient to be let alone. The hemorrhage soon ceased, and did not return.

Case 6.—In the terrible hand-to-hand conflicts which took place on the memorable 18th of June between the French and English cavalry, a young soldier of the English received a wound in the parotid region, immediately below the ear. I did not see this brave soldier until about three weeks after the accident, when it fell to my lot to bring to England the first ship-load of those who, though wounded but not yet recovered, had escaped the terrible field. These wounded men, about ninety in number, embarked at Ostend, and were placed ultimately by me in Haslar Hospital. The first object which caught my attention, on gaining the upper deck of the vessel, was this young man. He lay extended on the deck, pale, exhausted, almost exsanguineous, and seemingly dying. He spoke with difficulty. The wound below the ear had never closed, and it bled daily, so that he could no longer sit upright. As usual, a pile of rags, lint, portions of bandages, &c., steeped in blood, and now hardened, concealed the wound, and kept the danger out of sight. The sergeant, my only assistant, cautioned me not to remove this pile, as he had seen the dangerous results repeatedly in this case, whilst on their route from Brussels to Ostend. Regardless of this, I put Mr. Abernethy's plan in force; removed all pressure, exposed the wound to the air, applied a rag loosely to the wound, directing it to be constantly wetted with vinegar, and directed his head to be raised on pillows. The hemorrhage never returned, and he rapidly recovered.

In some persons there exists an hemorrhagic constitution, amounting to a serious disease.

Case 7.—A retired officer of the Cape Regiment of Infantry had been for some years subject to this hemorrhagic tendency. The slightest wound of the skin occasioned a considerable loss of blood, which flowed all the more that he continued to wash the wounded part with cold water. I found that pressure with the fingers, employed for but a short time, closed the wound uniformly, and arrested the hemorrhage. This gentleman, I found, was also subject to tape-

worm, from which he was relieved by a few doses of turpentine. The combination of these diseases was no doubt merely accidental.

In unhealthy sores, whether originating in wounds or otherwise, great caution is required in the avoiding incisions into such diseased structures.

Case 8.—A soldier in the Royal African Regiment of Infantry had for some time suffered from a corroding, ill-conditioned ulceration of the fingers and back of one of his hands. The surgeon under whose care he was wrote to me to come to head-quarters (Graham's Town, South Africa), to assist him in amputating this hand and another, of which I shall speak afterwards, when considering the effects of gun-shot wounds in the hand. On examining the disease, I found that the bones of one finger were carious, and at least contributed to maintain the disease. I recommended, therefore, that instead of amputating in the forearm, the three phalanges of this finger should be removed; but the surgeon, aware of the alarming hemorrhages which had followed all incisions, however slight, made into the semi-putrescent fingers and hand, declined attempting it. Persisting in my opinion, the case was handed over to me, to act as I thought fit. A straight probe-pointed bistoury was passed close to the bone, as high as the lateral ligaments connecting the first phalanx to the metacarpal bone, and these ligaments were cautiously divided successively, and the three phalanges withdrawn from the ulcerating mass. No bleeding followed, and the hand recovered under the use of lotions and nitrate of silver.

A lamentable case (9) is recorded in the "Transactions" of the Medico-Chirurgical Society of London, of a young man afflicted with a constitutional hemorrhagic disposition. He had been obliged to have a tooth extracted. Hemorrhage followed, which nothing could arrest, although it is clear to me that this might have been accomplished by the pressure of a child's finger. In an evil hour, an operating surgeon was sent for, instead of a physician. He tied the carotid artery. I need not say what became of the patient. Such cases injure the character of surgery as an art.

In general, the common dissecting-forceps is the best instrument for seizing hold of the divided artery, and securing it until a ligature can be applied, but the surgeon should also be provided with a tenaculum. When the tongue is wounded, for example, by a tooth accidentally driven into it, the closeness of the tissue renders the forceps useless. You must transfix the bleeding orifice of the vessel with the tenaculum, and tie in a small portion of the surrounding texture. The arteries in the palm of the hand are difficult to be secured, and may require the use of a tenaculum. They must be tied where divided, and, if possible, a ligature put upon both orifices, lest the freedom of anastomosis render your single ligature of no avail.

Lastly, when a large trunk, such as the brachial, femoral, &c., has been accidentally punctured or wounded, the vessel must be secured

where wounded, by placing a ligature above, and another below, the wounded part. In my younger days, surgeons mistook wounded arteries for aneurisms, and to the tumour caused by the effused blood they gave the name of traumatic aneurism. One error naturally produces another: they misapplied Mr. Hunter's ingenious treatment of aneurism by employing it in cases of wounded arteries. I denounced this extraordinary practice in my earliest lectures on Anatomy, but it continued to be in vogue for a long time. When the brachial artery was wounded at the bend of the elbow, the hospital surgeons of the day persisted in making another wound higher up, and tying the artery where it was not wounded, but sound. This practice, beneficial only to the student, as it afforded him generally an opportunity of witnessing several operations instead of one, has at last, I believe, been reluctantly abandoned. I am at a loss to comprehend how it ever got a footing amongst surgeons.—*Lancet, May* 17, 1856, *p.* 535.

132.—*Treatment of Frozen Persons.*—[While the animadversions of Dr. Marshall Hall on the usual treatment of drowned persons are fresh on our readers' minds, it may be well to notice the practice which has been found most successful in the Convent of the Great St. Bernard.]

No sooner have the *mercoliers*, accompanied by their sagacious dogs, conveyed the body of an unfortunate to the convent, than it is immersed by the monks in cold water containing a large quantity of ice. This is almost the only treatment employed, for it is generally successful. Should it fail there is little hope; for experience has taught these charitable men that no subsequent treatment is likely to prove efficacious.—*Lancet, June* 14, 1856, *p.* 671.

133.—ON THE PHYSICAL CHARACTER OF THE URINE IN RELATION TO DISEASE AND ATMOSPHERIC CONDITIONS.

By Dr. Thomas Moffat, Hawarden.

From meteorological observations taken at Hawarden during five years, in connexion with the phenomena of disease, it would appear that the maximum of diseases takes place with decreasing readings of the barometer and thermometer, and with directions of the wind from points between S.E. and N.W. by way of south; that the maximum of deaths occurs with similar readings of the barometer, but with directions of the wind from points between N.W. and S.E. by way of north; and that the maximum of ozone corresponds with the atmospheric conditions which give the maximum of diseases, and the minimum with those which give the maximum of deaths.

Seeing these results, it was thought highly important, both in a scientific and practical sense to, ascertain whether any changes in the animal functions could be discovered during atmospheric variations; and, if so, to conduct a series of observations on such functional changes in connexion with meteorological phenomena. Believing that variations in the physical character of the urine are sure and certain indications of functional derangement in the animal economy, I commenced examinations of the density and quantity of that fluid daily, and continued them for a time. On applying these to my meteorological register, the results were so encouraging that I determined upon conducting a regular series of investigations. The observations from which the results are deduced extend over a period of eighteen months.

The person whose urine was examined is a healthy man, of bilious temperament. He was actively employed, both in body and mind, in and out of doors, during the whole period of investigation. His time out of doors, freely exposed to the weather, was on an average six hours daily, namely, from 11 A.M. to 5 P.M.; and the quantity and character of his urine, for these hours, and for twenty-four hours, were daily ascertained. As the density of urine, like that of all other fluids, varies with its temperature, it was necessary to fix a standard temperature, and to apply a correction, plus or minus, as the case might be; and as 62° F. is the standard heat of water by which the specific gravity of liquids is compared, I took that number for the standard temperature of urine, and reduced all observations in this inquiry to that degree.

From frequent examinations of urine, while passing from higher to lower, and from lower to higher degrees of temperature, I found that the mean increase of density of the liquid, in passing from 95° to 65° F., is 0·001 for every ten degrees; and that, in increasing the temperature from 40° to 60°, the decrease of density is about the same value; so, if the density of urine be increased 0·001 for every ten degrees of Fahrenheit above 62°, and reduced 0·001 for every ten degrees between 49° and 62°, it will be found that the correction is sufficiently accurate for all practical purposes.

In conducting examinations of the urine, it must be borne in mind, that the quantity of *liquid* evacuated is no measure of the quantity of urine secreted. The *solids* excreted are the "real urine"; and it is by ascertaining the amount of these, that the depurating power of the kidneys can be estimated.

In calculating the quantity of solids, I used the formulæ of Drs. Christison and Golding Bird.

The following table shows the percentage of diseases, with variations in the readings of the barometer and thermometer, with the quantity of ozone, and directions of the wind, for a period of four years; and it also gives the mean daily quantity of solids in the urine, with similar variations, for a period of eighteen months.

	Percentage of disease.		Mean daily quantity of solids in urine. grs.
Barometer:—Increasing readings	26·8	.....	1386
,, Decreasing readings	73·2	.....	1460
Thermometer:—Increasing readings	37·7	.....	1366
,, Decreasing readings	61·8	.....	1439
Ozone:—Absent	28·1	.....	1395
,, Present	71·1	.....	1450
Winds:—North points of compass	47·1	.....	1284
,, South points of compass	59·3	.....	1368
Calms	49·5		
Calms and variable breezes		.....	1427

By this table it appears, then, that the maximum of solids in the urine, corresponds with those atmospheric conditions which give the maximum of diseases. The quantity is greater in dry than in moist air; the numbers being, on days of decreasing degree of humidity, 1506 grs., while there are 1354 grs. on days with increase of humidity.

Believing that the animal economy adapts itself to existing atmospheric conditions, and that it is owing to frequent changes of the weather that functional derangement and diseased action are produced, I ascertained the quantity of solid urinary products on all the days on which periods of increasing readings of the barometer commenced, and on those on which periods of decreasing readings began. The following are the mean quantities for these two sets of days.

	grs.
Mean at commencement of increasing periods	1413·5
Mean at commencement of decreasing periods	1547·7

giving a mean daily quantity of 1547·7 grains greater on days at the commencement of periods of decreasing readings, than on days on which periods of increasing readings commence.

Taking the mean quantity of solids on days on which diseases occur, and on days of no disease; and on days on which deaths take place, and on days on which there are no deaths; we find that the mean quantity is 29 grs. greater on days of disease than on days of no disease: and 74 grs. less on days of deaths than on days of no deaths. Thus we find that the maximum of solids in the urine corresponds with the atmospheric conditions which give the maximum of ozone and disease; and the minimum with those which afford the minimum of ozone and the maximum of deaths. The quantity of solids is 69 grs. greater than the mean daily quantity on days on which attacks of rheumatism and gout take place.

The mean daily quantity of urine from which the above results are deduced is 72 ozs., and a mean daily density 1019; which, according to Golding Bird's formula, gives the mean daily quantity of solids 1418·4 grs.

The mean daily quantity of urine evacuated from 11 A.M. to 5 P.M. was 11 ozs., the mean density of the same 1·020; which gives for six hours a mean quantity of solids 227 grs.

The mean quantity of liquid for one hour in twenty-four hours, is 3 ozs., and the mean quantity of solids for one hour in the same period is 59·1 grs. The mean quantity of liquid for one hour from 11 A.M. to 5 P.M. is 2 ozs. (1·83); and the mean quantity of solids for the same period in six hours is 37·5 grs.; giving a mean of 21·3 grs. less per hour daily, while a person is exposed to the open air, than the mean per hour for twenty-four hours.

According to these results, a man evacuates by the action of his kidneys, in round numbers, three and a half ounces of solids daily; or seventy-three pounds avoirdupois annually. Assuming that these numbers represent the mean quantities evacuated by the inhabitants of these islands, and taking the adult population at twenty millions, we find that they excrete 660,165 tons of solids annually; and by referring to the figures in the table, we find that they evacuate during the year 35,714 tons more on days of decreasing readings of the barometer and thermometer, than on days of increasing readings; 7,142 tons more when the humidity of the air is decreasing, than when it is increasing; 26,785 tons more on days when there is ozone, than on days of no ozone; 35,714 tons more with directions of the wind from south, than from north points of the compass; and 276,785 tons more during calms and gentle variable breezes, than when there is a moderate current of air.

Taking the adult population of London as two millions, and assuming that all the solids secreted by their kidneys are carried into the Thames, that river must hold in solution, or have suspended in its waters, a mean daily supply of 181 tons of solid urinary products. The quantity, however, varies with the weather; for, according to the above results, the Thames will contain ten tons more on days when the readings of the barometer and thermometer are decreasing than when they are increasing; a daily mean of three tons more when the humidity of the air is decreasing than when it is increasing; seven tons more on ozone days than when there is no ozone; about ten tons more with south than with north winds; and a daily mean of seventy-five tons more during calms and gentle breezes, than when there is a current of air. Let agriculturists bear in mind, that from the action of the kidneys alone of a London population, 66,016 tons of British guano are annually swept into the Thames.

The quantity of solids excreted in twenty-fours ranges between 650 and 1381 grains, giving a range of 1181 grains. The greatest quantity of liquid evacuated in twenty-four hours was 115 ounces, and the smallest 20, giving a range of 95 ounces. On the day on which the greatest quantity of solids occurred, the reading of the barometer, which was decreasing, was 29·764 inches. The wind was south-east; and ozone was perceived on the previous and following days. On the

day on which the smallest quantity of solids was observed, the barometer reading (the commencement of a period of increasing readings), was 30·040 inches; the wind veered from south-east to north-west. There was a trace of ozone, which had not been detected for two days, and it was not again perceived for a week. It then reappeared with the commencement of a period of decreasing readings of the barometer, and an increase of the quantity of solids in the urine from 650 to 1379 grains.

The mean quantity and density of the urine I have given is above that of Drs. Prout and Golding Bird, and M. Becquerel. By the former, from 30 to 40 ounces are given as the mean daily quantity of fluid, at a mean density of 1017, by the latter, the average quantity is stated at 45 ounces. I do not know from what number of observations these results were arrived at; but I do not hesitate to say that if they did not extend over a period of at least one year, very little dependence can be placed in them; *for the physical character of the urine is as variable as the wind*. To show how much the quantity of solid urinary products varies at different seasons, I may mention that the mean daily quantity for the three months, April, May, and June, 1855, was 1427 grains; while that for the three months ending September was 1192 grains, giving a difference of 235 grains. I may also state that the extreme quantities occurred once only in twelve months. To arrive at anything like accuracy, the urine of several persons should be examined daily for a period of two years at least.

The period over which this investigation extends is too short to allow of anything like reliable conclusions; but it may be stated that there is a greater quantity of solids excreted by the kidneys during decreasing readings of the barometer and thermometer than when the readings are increasing; that the quantity is greater during ozone than during no ozone periods, and with directions of the wind from south than from north points of the compass; and that it is greater during calms than when there are atmospheric currents.

It also appears that the quantity is greater with dry than with moist air, which may be owing to the cutaneous exosmosis being increased by the moisture in the atmosphere. We observe, then, that warmth and moisture of the air diminish the quantity of solids in the urine; and it is worthy of remark that Mr. Copland Hutchinson attributed the rarity of calculus among sailors to their sleeping in the lower decks, where the *temperature* and *moisture* of the air are increased to that degree, that the place becomes a vapour bath. The smaller quantity of liquids and solids in the period of the day between eleven, a.m., and five, p.m., may be attributed to the free action of the skin while the body was exposed to the open air.

It also appears that the quantity of solids is greater at the commencement of periods of decreasing readings than at the period of increasing readings; and it is when the former class of readings that the maximum of diseases takes place.

It also appears that while the urine of one person gives signs of functional derangement, without any apparent disease, under certain atmospheric changes, another person may be seriously ill under similar conditions of the air.—*Association Medical Journal, Aug.* 30, 1856, *p.* 736.

134.—ON SMALL DOSES OF OPIUM DURING DYING FROM PHTHISIS.

By Dr. Joseph Bullar, Physician to Royal South Hants Infirmary.

The treatment of the dying is not made a subject of systematic instruction, though it is one for which the assistance of our art is eagerly sought. The following cases illustrate the advantages of opium in alleviating the distressing dyspnœa, and in producing "euthanasia," in those dying by the lungs.

Case.—At half-past nine, p.m., I saw Mr. ——, aged 40 years, *in articulo mortis*, from phthisis. Since six, p.m., his breathing had become very laborious; his hands were cold; his face was covered with cold sweats, and livid. Raised by pillows in a semi-recumbent posture, he was restless, anxious, tossing his arms about, and moving from side to side; and he had the rapid, failing pulse of death. He said, with his usual firm voice, "If you do not relieve my breathing, I shall die;" with a painful expression of distress and agony. I gave him immediately ten drops of Battley's liquor opii sedativus, in a teaspoonful of water; in a few minutes he asked for more, as he felt somewhat relieved; but he thought he was taking spirits. At intervals of about ten minutes, more or less, he requested the dose to be repeated, until he had taken, in the course of an hour and a half, at least a drachm; and he gradually became quiet and tranquil, breathing short and quickly, but without distress; and he said more than once he was free from pain, and peaceful. His pulse gradually became weaker, and at twelve it was imperceptible, but his heart acted. He lay still, but when he spoke he showed that his mind was quite clear. At two he raised his arms several times, and, dropping them, exclaimed he was dying; and in answer to a question, he said he was in no pain, but peaceful. After this he did not speak, but lay quietly; and died about half-past nine in the morning, a deeper inspiration or two being the only indications of change before he ceased breathing.

In this case, the opium relieved the agony from dyspnœa, without producing narcotism, or any diminution of the clearness of his mind.

I felt no hesitation in giving opium in this case, as not long before I had been suddenly called to a member of our profession in the same condition. He had for several weeks been confined to his bed in the last stage of phthisis, and was reduced to such a state of suffering, from extreme emaciation and debility, that he had been anxious to die. About one o'clock, p.m., he was suddenly seized with the dyspnœa which precedes death, and I reached his house half an hour after-

wards. He was sitting up in bed, supported, with the face of death, and in the utmost anguish from dyspnœa. He begged me to give him a dose of Battley; but the difficulty of breathing was so extreme, and suffocation seemed so near, that I hesitated, for fear the opiate should stop respiration altogether and at once. I tried a small quantity of brandy and water, but this, he said, burned him, and he again begged for opium. I gave him fifteen drops of Battley's sedative solution, in a small quantity of water, and repeated the dose at intervals of a quarter of an hour, until he had taken three. He found immediate relief, and in a short time was able to lie down with his shoulders raised. He retained his consciousness during the afternoon and evening, and his family read prayers to him. Our mutual friend, Dr. Harvey, who kindly sat up with him until he died, gave him a fourth dose in the evening.

On examination, both lungs were extensively tuberculated, with large and numerous cavities in each. The lower lobe of the left lung was alone fit for respiration.

Both these patients were *in articulo mortis*, dying by the lungs, of suffocation; and in both the painfully laborious breathing, and the horrible anxiety and distress from such intense physical suffering, were rapidly relieved by small opiates frequently repeated, calming both body and mind, without any loss of consciousness. Both were in the prime of life, and had lived active, useful, and unselfish lives; and both were, in the best sense, good men, and in both that peaceful state of mind which is the result of such lives was evident as soon as the opiate quieted the extreme bodily distress which previously had been predominant. The opium thus changed a scene of hopeless and distressing agony into one of calmness and peace. To sit by as a passive spectator under such circumstances, believing that nothing can be done, or attempting to relieve by stimulants, which rather aggravate the sufferings by increasing action without giving power, is a painful position for those practising the healing art; but the power of alleviating not only this last distress of the dying, but also of the relatives around, is as encouraging.

The relief thus immediately obtained may be through the pneumogastric nerve. In the act of death in phthisis, the accumulation of muco-purulent secretion in the bronchial tubes is the cause of suffocation, and the channel of this painful sensation must be the pneumogastric nerve. As this nerve is also distributed to the stomach, the opium can act immediately upon it, and, by diminishing its sensibility, may relieve the patient from the distressing sensation of suffocation, although it does not remove or diminish the cause. This is in accordance with Dr. Marshall Hall's view, who termed the pneumogastric the internal excito-motory nerve of respiration, and believed that the presence of carbonic acid gas in the lung was the stimulus to respiration through this nerve, and that the immediately accelerated breathing of animals confined in an atmosphere of carbonic acid gas was a proof of this.

There are two popular objections against opium in these circumstances which certainly did not hold in these cases. The first is, that opium may hasten suffocation; but in these instances it removed the feeling of suffocation, and quieted the breathing. Normal respiration seems to be simply a reflex act without volition, but, on the slightest anormal excitement or impediment, it becomes a voluntary act. Opium thus given seems to bring back the act of respiration to its simple reflex condition, by relieving or removing that painful sensation which excites volition for relief. The second objection is the fear of narcotism and of death whilst narcotised; but in neither of these cases did the opiate obscure the clearness of the mind, though it relieved the distress of body: indeed, by relieving this physical agony, it left the mind so far undisturbed. In both these cases, small doses were given, and repeated at short intervals, from the relief they afforded. A large dose at once might be hazardous.

Since writing this, I have referred to Hufeland's 'Treatise on Opium,' in which he eulogises its virtues under the same circumstances, and I do not doubt that many employ it; but as, on the other hand, many are deterred from the fear of increasing the dyspnœa, or of producing fatal narcotism, and as the number of those who die from phthisis is so great, I have the less hesitation in making this communication, though it may have no novelty; for we often need to be reminded of what is old, as well as to be taught what is new; and the very purpose of our Journal is to communicate freely amongst ourselves those minor matters which we often make the subject of medical talk when we meet.—*Association Med. Journal, April 5*, 1856, *p.* 268.

135.—*New Mode of Rapid Mercurialization.* By Dr. Simon Nicolls.—I have found the following mode a quick one in bringing the system under the influence of mercury. In the commencement of my hospital practice, I met many cases of long-standing hemorrhoids, with induration and thickening of the verge of the anus, and with the view of removing or reducing this induration, I ordered small portions of ung. hyd. fort. to be applied to the affected parts night and morning, and though not more than two or three drachms were given, I found that a state of mercurialization was quickly induced in many cases, and in some cases to the extent of hypersalivation, even though half the ointment ordered had not been used. Having, about thirteen years since, lost a case of puerperal peritonitis, it occurred to me that had the system been more quickly and completely brought under the influence of mercury, my patient might have had a better chance of recovery. Since then, in any case I have met indicating a necessity for rapid mercurialization, I have ordered from 10 to 15 grains ung. hyd. to be inserted *within the sphincter ani*, thrice daily, and within from twenty-four to thirty-six hours I have in general in this way had ptyalism established; in fact, if not closely

watched, the mercurial action will become excessive. Since I have adopted this mode of administering mercury, I have not lost a case of peritonitis, even though puerperal. I trust others may find it as efficacious as I have done, but it must be used cautiously, and well watched. Otherwise it may, by inducing hyper-salivation, cause much trouble and annoyance. [We can bear testimony to the rapidity with which the system is mercurialized in this manner, having within the last few days seen a cure of extreme hyper-salivation from the absorption of an ointment composed of ungt. hydrarg. and nitras argenti, which was twice applied in very small quantities to ulceration in the rectum.—Ed. *D. H. G.*]—*Dublin Hospital Gazette, May* 1, 1856, *p.* 103.

136.—CASES ILLUSTRATIVE OF THE GOOD EFFECTS OF CONGELATION AS A LOCAL ANÆSTHETIC.

By Dr. Christopher Fleming, Surgeon to the Richmond Hospital.

Case 1.—*Painful Subcutaneous Tumour.*—Ann Hodgson, aged 30, of a peculiarly nervous temperament, states that the first symptoms of uneasiness in her leg came on about five years ago. The pain was then very like cramp, but soon became extremely agonizing. She afterwards felt a small tumour about the size of a shot on the outer side of the leg, which gradually increased and became exquisitely sensitive. The paroxysmal attacks have become more frequent and almost unbearable, so as to impair very much her general health.

On looking at the leg, there are no external evidences of disease, but on passing the fingers along the integuments, a hard, isolated spot is felt, which causes instantaneous winching, and which, when pressed on, throws her into a general convulsive state, almost uncontrollable from her agony. A smooth, spherical, solid body, about the size of a garden pea, is found here imbedded in the subcutaneous fat, and so identified at a point with the superincumbent integuments as to be thrown into profile. The connections of the tumour are superficial and perfectly loose underneath. Its character was obvious, and the necessity for its removal equally so. The case appeared to me to be one favourable for the adoption of Mr. Arnott's anæsthetic plan, and nothing could be more unmistakeable than its success. The congelation was as rapid as it was effectual in completely nullifying the painful sensation from pressure on the tumour before the operation was commenced; and subsequently, during its performance, there was a total absence of the slightest suffering. It was excised with an elliptical portion of the skin and fat immediately surrounding it. At the moment, the edges of the incision were hard and bloodless, and from the deepest point alone, blood was visible. The operation was, at the woman's desire, performed whilst she was sitting on a chair, with her foot supported on a form, my friend, Dr. Bellingham, having prepared and applied the frigorific mixture as directed by Mr. Arnott. The

whole proceeding was accomplished within five minutes. The blanched and solidified skin and fat gradually subsided; the lips of the wound were now gently approximated with a slip of adhesive plaster, and the usual precautionary means adopted to promote healthy action. On examination of the tumour all the characters of the "painful subcutaneous tubercle" were visible to the naked eye, and under the microscope; confirming the summary of details given by Mr. Paget in his admirable lectures on the subject.

Case 2.—*Encysted Tumour on the Leg.*—Peter Behan, aged between fifty and sixty, a countryman, in tolerable good health, applied at the hospital with a tumour occupying the middle of the calf of the right leg. It was the size of a small orange, and in its centre there was an opening, with patulous everted edges, communicating with a cavity from which a considerable quantity of thin, serous matter, much tinged with blood, oozed. This tumour had first appeared about twenty years back, and was about the size of a marble. It was, until latterly, moveable under the skin, and colourless, and its increasing size and tension were controlled by the occasional puncture of a pin or needle, and ultimately it was opened by a knife. On each of these occasions a quantity of colourless, watery fluid escaped. Its progress has been unaccompanied by pain, and now advice is sought for, rather on account of its unseemly aspect and disagreeable discharge, than from any other circumstance.

On examining it, it is found to be accurately circumscribed; it projects considerably beyond the surface, and lies imbedded in the calf of the leg, though apparently superficial to its muscles. The integuments covering it are natural—they are very adherent to its surface, and its deeper connections are equally intimate; an irregularly nodulated feel is communicated to the fingers on grasping it, and a probe passed into the opening, above noted, gives the sensation of a very uneven surface within. It was decided that the tumour belonged to the class of "encysted," that it was non-malignant, and that it should be removed.

Local anæthesia was produced, as in the first case, and with good results. An elliptical section of skin, including the opening alluded to, was quickly effected, and the superficial and deep connections detached. In the earlier stage of the operation no pain was felt, and in the latter, comparatively little. The length of the wound required, was between three and four inches, and the separation of its edges proportionably considerable. They were, however, easily brought together by three points of twisted suture. The usual precautions were adopted, as directed in the first case; a proper position of limb was enjoined; the upper and lower needles were removed in twenty-four hours after the operation, and the third in forty-eight; and now it may be said that scarcely a trace of suppuration is to be seen but along the tract of the third needle. There has been no constitutional disturbance, and the local reparative action is as favourable as it is possible to expect.

On examining the tumour, it was found encysted, the walls thin and delicate, and the cavity almost wholly filled with an organized growth from the inside of a fibrinous, warty-looking material, much resembling that not unfrequently found in diseased bursæ.

Case 3.—*The Growth of the Nail into the Flesh.*—A working man, aged 25-30, applied at hospital, harassed by protracted suffering from the above disease, and unrelieved by the treatment which had been adopted. The inner edge of the nail of the large toe was deeply inverted, and the usual symptoms of the disease were superadded. The slightest touch produced agony. Congelation was rapidly superinduced; the vertical section of the nail, and the evulsion of the morbid portion of it, were accomplished without consciousness, except from sight, and without a particle of pain. In this case the congelation was limited to the upper surface of the toe, and I did not expect such satisfactory results, as a portion of the integuments in the angle, at the seat of the disease, appeared to escape the action of the frigorific mixture.

Remarks.—When local anæsthesia can be accomplished by local means in operative surgery, it should always be preferred, as the most sanguine advocate for its establishment by chloroform in the usual mode, cannot conceal from himself the fact that, no matter how great the caution adopted, a certain amount of risk is attached to that functional disturbance of the several important organs involved in the process of inhalation. In the minor and more superficial operations in surgery, I have ever thought it a great desideratum to effect anæsthesia locally, and I do yet entertain this opinion, although I have been as successful as many in superinducing that wholesome amount of general anæsthetic influence desirable for the special object of the surgeon.

I have not met with any fatal or formidable contingency to shake my confidence in this valuable agent; but I must yet admit that exceptional cases have occurred to me, and this particularly in minor operations, in which uncomfortable effects have been produced by the adoption of general anæsthesia, and in which the local effects were by no means as satisfactory as was to be wished or expected. Indeed, I apprehend we must admit that the cases in which the effects of chloroform as an anæsthetic agent have been the least successful, are those where the bodily health has appeared to be perfect, and where the local disease has been limited and superficial, as if giving a hint to the surgeon, that under such circumstances the system at large should be left unmolested. It hence gave me no small amount of pleasurable reflection to witness in the above reported cases such gratifying results from the adoption of congelation, as recommended by Mr. Arnott for local anæsthesia, and especially, apart from the consideration of peculiarity of constitution and situation of disease, as noted in the details of the cases given, where the limited extent of disease in each case,

its superficial situation in each, and its rapid removal by operation, formed so many valid objections to anæsthesia by inhalation. To ensure success from congelation as a local anæsthetic, the surgeon must attend to the directions given by Mr. Arnott, in the preparation of the frigorific mixture, and its mode of application, and he must guard against any injurious results. It is well also that he should bear in recollection, that the term congelation really implies the actual condition of the structure he has to cut through, and that otherwise the knife may slip off, and enter where it is not intended; and, moreover, that when the object for operation is small, is subcutaneous and imbedded in fat, the congelation of those several tissues so completely masks its outline, that it is almost impossible to discover it. A slight indentation with the finger-nail beforehand may remedy this contingency, and appears to be a better provision than a mark with nitrate of silver, or with iodine, as the permanency of this stain I have found to be uncertain.—*Dublin Hospital Gazette, August* 15, 1856, *p.* 211.

137.—*Tannin.*—A useful mode of prescribing tannin for internal exhibition is in the state of solution with either the aromatic sulphuric acid, or dilute sulphuric acid; it readily dissolves in these fluids, and the combination can be given with marked benefit in suitable cases of colliquative sweating, or of chronic forms of diarrhœa.—*Dublin Hosp. Gazette, July* 1, 1856, *p.* 170.

138.—*Caustic Collodion.*—Dr. Macke (of Sorau) has for some years successfully used a solution of four parts of deutochloride of mercury in thirty of collodion, to destroy nævi materni. There is no better caustic when it is desired to cause them to disappear quickly and certainly, in those cases in which the use of a cutting instrument is objected to, or where excision is not very practicable, as on the cartilages of the ear; it is especially useful with very petulant children, when other caustics cannot be retained in their place, or when they are likely to be soiled by urine or fæcal matters.

The application of this caustic is easy, and is performed with a fine camel's hair brush; its sphere of action may be perfectly determined, and it dries so quickly that it is impossible that it should extend to any neighbouring healthy part, or be removed in any way by the patient.

If much inflammation supervenes, cold applications are useful; the eschar is solid, one or two lines in thickness, according to whether the caustic is applied once, or more frequently; it separates from three to six days after, and leaves but a trifling cicatrix.

The pain is seldom intense and soon passes over. The author, who has found great success in many cases with caustic collodion, is quite certain that there is no fear of poisoning, and recommends its use to

the profession as being as certain in its results as it is easy of application.—*Dublin Hospital Gazette, July* 1, 1856, *p.* 170.

139.—*Case of Drowning successfully treated according to Dr.* MARSHALL HALL'S *Mode.* By Dr. D. HADDEN, Skibbereen.—[Here is a deeply interesting and successful case, where the new method of inflating the lungs was practised. In a brief letter to Dr. Marshall Hall, Dr. Hadden says]

The case was that of a boy, about thirteen years of age, who, when bathing, got a cramp in the right leg, and after struggling for a considerable period sank exhausted. He remained under water for nearly twenty minutes, and when brought to land appeared quite dead.

I happened to be passing at the time, and immediately put your plan into operation, and after continuing it for more than a quarter of an hour, he began to show some symptoms of returning animation.

His recovery is the most remarkable I have ever witnessed, and must have been impossible if treated according to the methods heretofore in use.—*Lancet, August* 9, 1856, *p.* 153.

140.—*Preparation of Caustic with Gutta Percha.*—M. RICHARD has recently brought this before the Paris Society of Surgery. Gutta percha in powder is intimately mixed with pulverized caustic in proportions according to the strength required, as, *e. g.*, two parts of chloride of zinc to one of gutta percha. The mixture is to be gently heated in a tube or porcelain capsule, over a spirit lamp. The gutta percha softens, and becomes thoroughly impregnated with the caustic, so that on cooling a gutta percha port-caustic is formed. By its properties the gutta percha possesses the advantages of not altering the tissues, of preserving its consistence and flexibility, of insinuating itself by its suppleness into either natural or abnormal canals, however tortuous, of assuming any desired form under the fingers of the surgeon, and of allowing, by reason of the porosity of its molecules, the exudation and unimpeded action of the caustic it contains.—*Journal de Chimie.*—*Med. Times and Gazette, August* 2, 1856, *p.* 120.

141.—OBSERVATIONS ON PERICARDITIS.

By Dr. ROBERT LAW, Professor of the Institutes of Medicine in the School of Physic in Ireland.

[It is a singular fact connected with diseases of the central organ of the circulation, that they are amongst the most obscure and difficult of detection of all diseases, and that the heart, although we look upon it as a kind of detective in reference to the affections of other organs, exercises a most remarkable reserve on its own affections. We must

canvass the actual state of our knowledge of the diagnosis of this disease, with a view of seeing what auscultation and percussion have done for us.]

We know that when the opposite pericardial surfaces, roughened by lymph, are allowed to rub against each other, they produce a sound fitly designated the attrition murmur. It is the proper sign of pericarditis, and its discovery has been the grand achievement of auscultation in redeeming this disease from its diagnostic reproach. But, I would ask, is this sign constantly present when the pericardial surfaces are in the physical condition to produce it? No, it is not. The surfaces may have the necessary conditions for its production, but may be, and very frequently are, kept asunder by interposing fluid, and it is not until this be more or less removed that the phenomenon will be developed. Something of the same kind occurs not only in pleuritis, but in pleuro-pneumonia, where, in case of hepatization of the lung—although the pleural surfaces are in a condition to produce the attrition murmur if they rubbed against each other—yet the state of the lung being such as to refuse admission to the air, the motion required for the production of the phenomenon is wanting, and it is not until resolution of the hepatization has made some progress, as indicated by the crepitus redux, that it appears. In many cases the pleural element of the pleuro-pneumonia would have altogether escaped detection if the stethoscope had not discovered the unlooked for friction sound. I have met with cases of pericarditis where the extent of the effusion never allowed the pericardial surfaces to come into contact, so that the false membrane in which the heart was enveloped exhibited a uniformly rough, flocculent appearance. In other cases, although the effusion had been so considerable as completely to submerge the heart, the point of it could still rise above the fluid and strike against the opposite pericardial surface, and so produce a very circumscribed friction murmur. And in the necroscopic examination of such cases we could measure the exact limits of where we heard this murmur, by the smoothness of the point of the heart and of the opposite surface, strongly contrasting with the rest of the rough flocculent false membrane. We here see an instance of function modifying organization, and nature endeavouring, as far as possible, to assimilate the pathological product to its parent structure. In some cases of pericarditis, with very copious effusion in certain positions of the body, the friction murmur will be present, and be absent in others. Dr. Corrigan and Dr. Stokes have both noticed this fact, the sound being very marked when the patient was examined in the horizontal posture, while it was no longer to be heard when he sat up.

As many cases of pericarditis are attended with extensive effusion, when the interposition of the fluid will interfere with the production of the friction sound, auscultation now only intimates to us the feeble, and, as it were, the deeper and more remote action of the organ. It is now on percussion we have chiefly to rely, which helps us, by mark-

ing out the extent of the effusion. This occasions a dulness, which can be due only to pleuritic effusion, or to dilatation of the heart, or pulmonic solidification, or pericardial effusion. We shall have but little difficulty, in general, in distinguishing between effusion into the cavity of the left pleura and effusion into the cavity of the pericardium. In case of pleuritic effusion, the heart will be displaced unless it be retained in its position by an adhesion contracted between its exopericardial surface and the internal surface of the lung. Can we as readily distinguish between the dulness caused by a dilated heart and by pericardial effusion? I believe we can, generally; the history of the case will materially aid us; any considerable amount of dulness from effusion will be sure to be attended with a sense of oppression, which comes on suddenly, often preceded by pain in the pericardial region. I say, often preceded by pain,—but I would ask *(en parenthese)*, why is not the pain more constant, when it is so frequent a symptom of the inflammation of this structure elsewhere? This has often perplexed me. Before experiencing the sense of oppression, the patient was not aware of any præcordial distress; there was no premonitory announcement of it; the distress, if any, from dilated heart is ever gradual. I believe, further, that the application of the rule, laid down by Laennec, will generally avail in establishing the distinction, namely, that in case of dulness from effusion, the sounds of the heart are strictly confined within the limits of the dull sound, while in dilatation they are heard beyond these limits; so that the extent to which they are heard beyond the limits of dulness serves as a measure of the dilatation of the organ. A case may occur, however, in which this rule may fail us, when pericarditis with effusion is complicated with aneurism of the ascending and arch of the aorta, so that the more obscure signs of the pericarditis are lost in the more striking and palpable signs of the aneurism. I have met with this complication in a woman, aged 28, who was under my care in hospital, exhibiting the unmistakable signs of aneurism of the ascending and arch of the aorta. Her breathing was greatly oppressed, and attended with stridor: she had also some difficulty in swallowing; her face was deeply congested; her neck swollen; there was considerable dulness to percussion at the upper part of the sternum, and towards the right side; corresponding to the dull sound there was a double pulsation, which could be followed down to the heart, whose action was weak. The patient was constantly in the sitting posture, with the body bent forwards; there was no question of the existence of an intro-thoracic tumour, and almost as little of that tumour being an aneurism; the absence of an abnormal sound satisfied us that the aortic valves were free. The patient was almost *in extremis* when admitted into hospital. Examination of the body revealed a large aneurism of the ascending aorta (in which the valves were not engaged), and of the part from which the anterior innominata proceeds; there was, besides, a pericardium filled with turbid serum, in which the heart, covered with flocculent lymph,

seemed suspended; the extent of the effusion prevented the immediate contact of the opposite pericardial surfaces; and the double pulsation of the aneurism, mingling, as it were, with the double sound of the heart, nullified the two signs by which the complication could have been detected, viz., the attrition murmur, and the confinement of the heart's sounds within the limits of the dulness produced by the effusion. Sir Philip Crampton communicated a precisely similar case to the Dublin Pathological Society, in which the more prominent signs of aneurism so completely obscured the pericardial complication that its existence was not suspected during life.

The dulness caused by a solidified left lung can hardly be confounded with the dulness of pericardial effusion, although I confess I have met with cases of pericardial effusion so considerable as to push aside the left lung, and so to compress it posteriorly that it no longer admitted the air, and thus there did exist a difficulty in determining if the pericardial affection was complicated with pneumonia. Such a case I saw in Sir Patrick Dun's Hospital, under the care of Dr. Smith; and such another I had under my own care; but in this latter case my difficulty was removed by making the patient assume the prone position, when the sound posteriorly became clear, and the respiration audible. This manœuvre removed the compression of the lung. But I may be asked, might not the compressing material—and which changed its place with the position of the body—might it not have been effusion into the pleura. I answer in the negative: for if it had been, it would have caused dexiocardia or displacement of the heart, which it did not do. An adhesion between the exopericardium and pleura lining the internal surface of the lung could alone prevent this. In case of a solid lung, the heart's action appears stronger and more audible than under its normal circumstances, from the pulmonary structure being now a better conductor of sound; while, when the organ is surrounded with fluid, and compressed by it, it beats more feebly, and is heard through a medium of inferior conducting powers.

If we have had the opportunity of observing from its commencement a case where effusion into the pericardium has taken place, as occurred to me very recently, we find the area of dulness gradually diminishing, and, sooner or later, is heard a very limited, circumscribed, friction murmur corresponding to the apex of the heart. This murmur is then heard to an increased extent, both in length and in breadth, from the apex to the base of the organ, and from side to side. It is at once curious and interesting to observe the different characters of the sound in different parts, varying in smoothness and softness, according to the relative portions of the surfaces coming into contact with each other; the sound corresponding to the parts that had been longest rubbing against each other being comparatively smooth, while those brought into more recent contact emit a much rougher sound. I had an opportunity of remarking this in a case which I had under

my care a short time since: the smooth friction sound corresponding to the apex contrasted strongly with the coarser sound generated nearer to the base of the organ. I would wish to direct especial attention to the direction of the friction murmur as serving to distinguish between it and a vulvular murmur, which, as far as regards the sounds themselves, is sometimes no very easy matter. While the different friction murmurs are produced in the direction of the motions of the heart in the pericardium, the vulvular murmurs follow the current of the blood, whether in an outward or in a retrograde direction. The heart, as it acts normally in the pericardium, has a triple motion :—1. A tilting forward motion, by which its point strikes against the side of the chest; 2. A motion from its apex to its base; 3. A motion of rotation on its axis. If the heart be free to act in the pericardium, unrestrained by adhesive bands, the result of a former inflammation, or by intervening fluid, the result of the existing inflammation, its rough surfaces will rub against each other and produce the friction sound in this triple direction. I have seen the double murmur of aortic valve disease sometimes resemble the attrition murmur of pericarditis so closely, that if I had but the sound alone to distinguish them, I should have found it extremely difficult; but happily we had the directions of the respective murmurs to aid in our diagnosis.

A previous inflammation will produce a partial adhesion of the pericardium, and this will modify the extent and direction of the friction murmur. I had a remarkable instance of this in the case of a man, about forty years of age, in which the *bruit de cuir neuf* was more marked than I had ever before heard it. He had long been the subject of a cardiac affection; the pericardium was found to be greatly increased in thickness, and to have acquired the consistency of fibro-cartilage. Its cavity was divided into different chambers, formed by membranous dissepiments of various lengths and depths proceeding from its opposite surfaces. Some of these chambers contained fluid more or less turbid, and many were lined with recent lymph. I had no doubt that it was a case of long standing, and had been the subject of various inflammations occurring at different times, the lymph of the original inflammation being the matrix or the blastema of the subsequent pathological processes which had issued in its increased thickness and induration.

It is impossible to fix the duration of the friction murmur. It may pass away in very few days, leaving not a trace behind. Dr. William Beatty brought me to see a case of pericarditis with friction murmur; when we came to listen to it he admitted that what he had heard distinctly the day before had now ceased. An unusually strong action of the heart was alone to be heard, from which I predicted an adhesion of the pericardium, which post-mortem examination proved to be the case. At other times it may continue for weeks, or even months, when it disappears. What then happens? Either a complete removal of

the material on which the murmur depended. or a partial removal of it, the remainder connecting the opposite surfaces, and destined to become cellular bands of various lengths, according to the position they may occupy,—longer the nearer they are placed to the apex of the heart, in consequence of its greater motion, and shorter as they may happen to be nearer to the base, on account of the more limited motion of these parts; or it may remain so as to effect a complete agglutination of the opposite surfaces, and thus entirely obliterate the cavity of the pericardium. Have we now done with the disease? Has it now undergone a radical cure? Or, before we canvass this question, I would ask, have we any sign, or signs, upon which we can rely as indicating adhesion of the pericardium? These are deeply interesting questions; I shall consider the latter first, and shall refer to what are regarded as the highest authorities on such a subject.

Dr. Hope remarks: "I certainly consider this diagnosis to be one of the very few connected with the heart which cannot be made with absolute certainty, and I never, therefore, venture to assert respecting it."

He further remarks, that by a combination of signs he has succeeded in detecting it:—First, by the heart's beating as high up as natural in the chest, and causing a prominence of the cartilages of the left præcordial ribs. Second, and which he regards as the most characteristic of all, an abrupt jogging or tumbling motion of the heart, very perceptible in the præcordial region with the cylinder. Third, a history of previous pericarditis, especially if connected with acute rheumatism, affords strong presumptive evidence corroborating the preceding signs, and the absence of such history should make the auscultator pause before he ventures on a diagnosis in stronger terms than that it is probable or possible. With regard to the first sign stated by Dr. Hope, I would say, that I have never observed this high action of the heart and prominency of the cartilages of the left præcordial ribs in adhesion of the pericardium, but I have observed them in another morbid condition of the pericardium, in case of effusion into its cavity, when the fluid, gravitating towards the most dependent part, pushed up the organ towards its base, and produced a prominency corresponding to the base, the appearance which Louis designates "voussure." It is the pushed-up heart that forms the prominency, not the fluid, as is generally believed.

As to the second sign proposed by Dr. Hope, I can only say, that his description of an abrupt, jogging, tumbling motion, does not describe the irregular action that I have sometimes observed in cases of adherent pericardium. Dr. Walshe's description of it as a tumultuous, confined action goes nearer to conveying an idea of what I have heard. As I have observed it, it has been a kind of pulling, dragging motion, as if one contraction of the ventricle was resolved into a series of short, abrupt contractions, sometimes so feebly and faintly expressed as if no impulse were communicated to the blood by the heart as it passed

through it. The jogging, tumbling motion that I have observed has been in a quite different affection, viz., in the weak, gouty heart. M. Bouillaud remarks: "Je ne connois encore aucun signe qui puisse faire reconnaître les adherences du pericarde." Dr. Sanders thought he had discovered a positive sign of an adherent pericardium in the retraction or dimple taking place during the systole of the ventricle in the epigastrium immediately below the false ribs, and which he ascribed to the diaphragm being drawn in by the ascending motion of the heart. Dr. Hope observes on Dr. Sanders' sign:—"I have searched for this attentively in several cases of adhesion, but have not been able to detect it in any degree that could constitute a sign. Dr. Heim, of Berlin, also proposed this sign. Laennec, speaking of it, says:—"J'ai cherché inutilement depuis deux ans verifier cette observation chez tous les malades qui presentaient quelque signe de trouble de la circulation, et je n'ai jamais pu apercevoir le creux dont il s'agit, et dans le nombre de ces sujets il s'en est trouvé plusieurs dont le cœur adherait au pericarde." Dr. Stokes is the last authority to which I shall refer, as being the latest, and who had, therefore, the opportunity of testing the value of the signs of those who preceded him. He remarks:—"I more than doubt that there is any certain physical sign of adhesion of the pericardium, and have never been able to verify the sign of Dr. Hope of the double jogging impulse." I am bound to say, that none of the signs hitherto proposed has done more than to enable us to assert the likelihood of an adherent pericardium.

The sign which I propose, and with confidence, has this advantage, that we need not have followed the disease in its progress, nor do we require to have had any previous knowledge of the case. I have again and again tested its truth by post-mortem examination, as have others to whom I have communicated it, and have found that it may be relied upon. The sign to which I allude is, "*the persistence of the same extent of dulness to percussion in the præcordial region, no matter what position the individual may assume.*" The area of dulness on percussion in the præcordial region will be the same under every varying position of the body. The heart becomes so braced up that it cannot move as it does in its normal state, when, if examination be made, the patient either lying, or sitting, or standing, the results of percussion will vary accordingly, the dulness being greater in the first position, and less in the two latter. The individual himself, also, is quite conscious of the existence of some solid resisting body within his chest, which does not move in the changes of posture of his body, but impedes its motions.

I have proved this sign in cases where I have seen the patients all through their attack of pericarditis, and also in cases where the adhesion had been already formed, and have never found it to disappoint me. I, therefore, claim for it that it is *the physical sign* that may be relied on in proof of an adherent pericardium.

I would now return to the questions whose consideration I postponed,

viz., when adhesion of the pericardium has taken place, have we now done with the disease? Has it now undergone a radical cure? Can we give the patient a *billet de santé?* I shall pursue the same course in the consideration of these questions that I did in the former instance, and shall adduce the opinions of those whom I regard as the highest authorities on the point. Our improved pathological knowledge has simplified the solution of these questions in some degree, inasmuch as we now know that much that had been charged upon pericarditis did not really belong to it—we allude particularly to the hypertrophy—which, from its having been so often found in cases of adherent pericardium, was thought to be an almost necessary result of it. We now know that this hypertrophy is most commonly the effect of the endocarditis that is so often coincident with pericarditis.

It is remarkable how various are the opinions of different high authorities on the pathological importance of adherent pericardium. All the older pathologists, viz., Lancisi, Vieussens, Meckel, Senac, Corvisart, and Morgagni, thought that with a complete and intimate adhesion of the pericardium the patient could not live in a state of health. Laennec, in stating his own opinion on this point, speaks first of Corvisart's in the following terms:—"Il (Corvisart) ne pense pas au reste qu' on puisse vivre et vivre sain avec une adhérence complète et immediate du cœur au pericarde." Then, in asserting his own opinion, he remarks:—"Je puis assurer que j'ai ouvert un grand nombre des sujets qui ne s'etaient jamais plaints d' aucun trouble dans la respiration ou dans la circulation, et qui n'en avaient presenté aucun signe dans leur maladie mortelle quoiqu' il y eut adhérence intime des poumons ou du cœur, et je suis tres portè a croire d' après le nombre de cas de ce genre qui j'ai rencontrès que l'adhérence du cœur au pericarde ne trouble *souvent* en rien l' exercice de ses functions." M. Bouillaud observes:—"Les adhérences ne me paraissent pas troubler nécessairement le jeu du cœur, ou en rencontre du moins chez des personnes qui jouissaient de la plus florissants santè." It is remarkable that English physicians regard adherent pericardium with much more alarm and apprehension. Dr. Hope, from having always found enlargement of the heart in cases of adherent pericardium, concluded that the former is the constant and necessary result of the latter. He remarks:—"I have observed that cases of adhesion terminating in enlargement often hurry to their fatal conclusion with more rapidity than almost any other organic affection of the heart; and, on the other hand, I have seen patients repeatedly die from the consequences of adhesion, the history of which I could trace eight, ten, or more years, yet some individuals would represent their health to have been perfect during the greater part of that time. Hence I infer that, though close adhesion may not for a time create much inconvenience, its effects are ultimately fatal." Again he remarks:—"Unless the effused lymph as well as the serum be absorbed, it causes an adhesion of the pericardium, and thus con-

stitutes a destructive disease." Dr. Watson designates adherent pericardium an apparent but unreal recovery. Dr. Stokes has not expressed himself distinctly or directly on this point. My own experience on the subject is, that while I have met with several cases of adherent pericardium where the patients suffered no inconvenience either in the circulation or respiration, and when death from other causes proved the adhesion:—still I have met with so many more cases in which the patients, after having had one attack of pericarditis, and affording every reason to believe that the pericardium had become adherent, were afterwards the subjects of an intercurrent inflammation in the cardiac region, which at length terminated fatally: and where post-mortem examination revealed an adherent pericardium, the adhesion being effected through the medium of a false membrane, whose length and density were in proportion to the age and duration of the disease, and which besides exhibited various pathological modifications, such as being the seat of hemorrhage, suppuration, tubercle, and cancer:—with such evidences as these, and comparing the one set of cases with the other, I have no hesitation in saying, that I should ever consider an individual with an adherent pericardium to be in an insecure state, inasmuch as the disease has left behind it a sickly product, not alone more susceptible of being affected than the parent structure was, but which has, as a principle of its constitution, on the occasion of every future pathological movement, a tendency to become more and more degenerate, and thus to drift more and more into unhealthy action.—*Dublin Quarterly Journal, August*, 1856. *p.* 73.

142.—*On the Revival of Leeches.*—[The following is from an official circular, published by the French Minister of War, detailing the proceedings to be adopted in the French Military Hospitals:—

As soon as leeches have come off, they are to be placed in a mixture consisting of one part of vinegar, and eight of common water, at a temperature of from 56° to 68°. Parcels of eight or ten should be placed in from three or four ounces of this, so that the leech may have room to plunge and submerge itself. Scarcely is it introduced than it begins disgorging itself, gradually loosing its vivacity, and becoming soft to the touch. It is then removed from the bath, and gently pressed towards the mouth between the thumb and index finger, by a sort of flattening movement, made without elongating the body, until all the blood swallowed has been evacuated. If the leech cannot be easily emptied in this way, it is to be replaced for a moment in the acid bath. The acidulated water must be changed for every parcel, so that about a quart is required for 100 leeches. After disgorgement, the leech is washed twice in common water, and is then introduced into a glass or earthen vessel, large enough to allow of about half a gallon of water to every ten leeches. This is to be filled with water at from 50° to 68°, covered with canvas, and kept in the shade, at a

moderate temperature, and not exposed to sudden changes of this. Every morning the water is to be changed, and the dead leeches cast out. From the fourth to the fifth day, the leech may be reapplied, and will draw as much blood as at first. The disgorgement is more easy and effectual, and less injurious to the animal the sooner it is put into force. The essential point is to discharge the blood as completely as possible, so that the leech ought not to weigh sensibly more after the process than it did prior to sucking. When the leech has not been reapplied during the four or five days after its disgorgement, it is more liable to die during the next two or three months than are leeches unapplied, kept under the same conditions. Some leeches die after the first four days, and some immediately after sucking; but the losses are less in proportion as the disgorgement has been made early. A second disgorgement is as easily effected as the first, and frequently more so. A third application, to be followed by the same process, may be attempted; but such reapplications must be suspended when less blood is found to be swallowed, and the suction seems insufficient, which will generally be the case after the second reapplication. The leech should then be left at rest in a shady place, protected from atmospheric vicissitudes, the vessel containing ten or fifteen leeches for every half-gallon of water, which must be changed every second or third day, removing each time the dead leeches. In this way a proportion will be saved, which may be usefully reapplied after six weeks or two months.—*Revue Médicale.—Medical Times and Gazette, Oct.* 11, 1856, *p.* 375.

143.—*Paracentesis Thoracis.*—[Mr. Stanley here gives us a few practical remarks on the improvements in this operation.]

As a rule, the best physicians are not in favour of tapping the chest; but where it is necessary, Mr. Stanley said, the position for the operation is between the fifth and sixth ribs midway between the sternum and spine, close on the upper edge of the sixth rib. This is the most eligible spot. One of the chief points to be avoided is allowing air into the chest after the operation. This danger has been obviated very much by an India rubber apparatus, which, by its elasticity, soaks as it were the purulent collection gradually from the pleura, allowing at the same time the compressed lung ample time to expand and fill the chest. This plan has been tried in Dublin, where the experience of Stokes in pleuritic cases, and the mechanical skill of the surgeons who have contrived the compression clamp in aneurism, Carte, Bellingham, Hutton, &c., has been also directed by Mr. H. Leet to the formation of an India rubber expansive ball attached to the apparatus for puncturing the chest, which seems to answer every purpose.—*Association Medical Journal, August* 23, 1856, *p.* 716.

144.—*Scott's Plaster.*—In some affections of joints (of the knee particularly), it is very useful sometimes to get the part into as quiet a state as possible. The best plan yet known is that called Scott's plan, much used in London hospitals, viz.: Sponge the skin of the part (the knee, for instance), with spirits of camphor till the skin smarts, and looks red. Then spread an ointment, composed of equal parts of the ung. hydrargyri fort. cum camphorâ and plain ceratum saponis, on lint; cut the lint into narrow strips, and apply them freely round the knee to the part, fully four inches above and below the condyles of the femur: over this next apply soap plaster, spread on calico, cut also in strips; this may be applied for a fortnight or longer, if no pain ensues in the knee: while over the whole is rolled a bandage or roller, steeped in gum and chalk. The effect of this plan in removing pain and swelling is sometimes very remarkable. It is in particular favour at St. Bartholomew's Hospital and the London Hospital, this year, in cases where it is advisable, especially in females, to give the patient every chance of recovery previous to having recourse to the knife.—*Association Medical Journal, March* 8, 1856, *p.* 184.

145.—*An Easy Mode of Treating Ingrowing of the Nail of the Great Toe.* By J. Broke Gallway, Esq., Surgeon Royal Artillery. (Communicated by Dr. Andrew Smith).—[This is an affection of no very significant pretensions, very common, and very troublesome. The usual means of relief, by forcing a sharp instrument under the nail up to its root, is a very cruel and barbarous practice, which we shall be glad to abandon for a better substitute.]

I have found the following little expedient attended with but trifling pain, while it offers a most efficient remedy for the evil:—With a fine and well-tempered file, let a vertical incision be carried down to the matrix, from the root to the free margin of the nail, a few lines from the lateral border, according to the degree and extent of the inversion. This part of the step can be performed by the patient himself, and at his own leisure, which in private life has the advantage of robbing the operation of much of its terrors. It is easily effected, and, I need not say, painless. When thus prepared, the surgeon should gently seize the divided edge of the smaller section with a pair of broad-bladed dissecting forceps, and with an infinitesimal amount of tractile and of slightly jerking force tear the offending portion of the nail from its bed and lateral connexions. It is really a very neat operation, and most satisfactory in its results. It should be repeated at the opposite border of the nail, supposing both lateral margins to be inverted.

By this little expedient I have lately resuscitated a poor fellow who had become quite lame in both feet from this condition.—*Lancet Aug.* 9, 1856, *p.* 160.

146.—*Treatment of Ingrowing Toe Nail.* By C. Lovegrove, Esq., Brighton.—[A young lady, who had been under a surgeon of some renown in London for three or four months without benefit, was effectually relieved in the following manner:]

The nail, which is usually very thick on the great toe, was scraped moderately thin with a piece of glass, and then the whole surface covered with a good coating of nitrate of silver, which was accomplished by rubbing the stick of silver carefully over the whole of the nail, moistened with a little water; after which a linseed meal poultice hot) was applied, and the next morning nearly the whole of the nail was separated from the flesh, and another milder application divided it entirely. The nail was then removed without the least pain, and the patient assured me she had not suffered at all during the whole operation. In less than a fortnight after the operation was completed, the patient wore her usual boots with comfort, and before leaving Brighton, a new nail was rapidly growing.—*Lancet, Aug.* 30, 1856, *p.* 250.

147.—ON THE ECRASEUR.

By Dr. Robert Kirkwood, Glasgow.

[This is an instrument invented by M. Chassaignac, one of the surgeons of the hospital Lariboisière, Paris, by means of which the soft tissues may be divided without effusion of blood.]

Description of the Instrument.—The *ecraseur* consists essentially of an articulated metallic ligature or chain, and a mechanical contrivance, by means of which it may be progressively tightened; and thus in principle resembles the ligature and double canula of Gooch, and the *serres-nœuds* of Graefe and others. But while, at least in principle, it resembles these instruments, it differs from them altogether in form and construction. By the substitution of a chain ligature, possessing an amount of resistance greatly superior to that of every other form of ligature in use hitherto, it became possible to employ a proportionately increased constricting force; and this, in effect, is what M. Chassaignac has done, his ecraseur being simply an instrument capable of directly effecting the division of the tissues, by the gradual employment of a force superior to their resistance. The instrument, I have said, consists essentially of a chain and a constricting apparatus; it is the form of the latter which determines the form of the instrument; but as different contrivances may be employed for effecting the same object—the tightening of the chain—so the instrument has been made of different forms, according to the ingenuity and skill of different makers. Without pretending to determine the merits of one form or other, I shall content myself with describing the instrument which M. Chassaignac himself employs, merely premising that the measurements, which are designed to give a general idea of its size, form, and

strength, must be accepted as approximative only, and not as absolutely accurate.

The several parts of which the ecraseur is composed are, a canula with a double rack or catch attached to it, two arms or branches joined to a handle, and a chain ligature. The canula, which is flattened, is made of German or other composition metal one-eighth of an inch thick, and measures about twelve inches in length, three-quarters of an inch in breadth, and half an inch in thickness. In it there are two openings, situated laterally at a distance of about five inches from one extremity, and close to these are placed two spring catches or clicks. Within this canula, and accurately fitting it, are two moveable arms or branches, each serrated on its external lateral surface, in order to receive the catches attached to the canula; these arms are each fixed at one extremity by a sort of hinge attachment, in the centre of a handle placed transversely, which acts as a lever, and by means of which the arms are made to move, and thus tighten the chain. The handle measures about four inches; the arms are each a quarter of an inch square, and measure in length about three-fourths of an inch more than the canula, from which they project sufficiently far to permit of the remaining portion of the instrument—the chain—being attached. The chain is flattened laterally, and also articulated, I believe, like a chain-saw; but it is smooth on its inner or cutting surface, not serrated like the saw. It measures about twelve inches in length, and is attached by a mortise and tenon joint to the free extremities of the arms of the instrument. The form and disposition of these parts, however, will be better understood by a reference to the following figures, than from any description I can give.

Fig. 1.

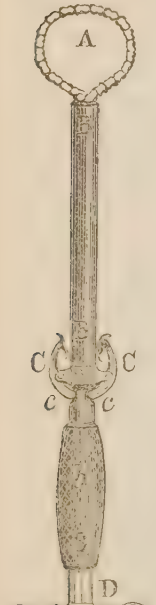

Fig. 2.

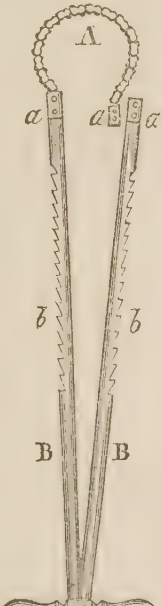

Fig. 1 represents the instrument complete: A, the chain; BBB, the canula; *b*, a piece of ebony attached to the canula, so as to afford a better grasp; cc, catches or clicks; *c c*, lateral openings in the canula, showing the serrations on the arms; D,

portion of the arms projecting from the canula, as happens when the instrument is in operation; E, the handle.

Fig. 2 represents the arms, minus the canula: A, the chain; *aaa*, the mode of attachment; BB, the arms free from the canula; *bb*, the serrations into which the catches are received; C, the handle.

Such, then, is the instrument M. Chassaignac employs, and it only remains for me now, before quitting this part of my subject, to notice briefly a modification which has been proposed for certain operations. In his lecture upon the application of ecrassement lineaire to the removal of uterine polypi, the amputation of the neck of the uterus, &c., he showed a modified form of ecraseur, which he had recently invented, and which he had either employed, or which he proposed to employ—I am not certain which—in performing these operations. The modification consists in giving what may be called a pelvic curve to one end of the canula, and forming the extremities of the arms of strong blue steel, slightly bent, and sufficiently flexible to adapt itself to the curve, and move easily within the canula.

Mode of Operating with the Ecraseur.—The preliminary steps vary somewhat according to the operation to be performed: for example, if it is a fistula which is to be divided, the chain has merely to be passed through it; if, on the other hand, it is a hemorrhoidal tumour which is to be removed, a strong ligature must first be passed tightly round its base, so as to pediculate it, before applying the chain. As these, however, have reference to the mode of applying the chain in individual cases, and not to the general mode of operating, which—the chain once applied—is the same in every case, I shall proceed now to the general description, and when I come to speak of the operations which have been performed, will select as illustrations several in which the preliminary steps are different.

The operator having satisfied himself that the instrument is in good working order, causes the free extremities of the arms to project beyond the canula, and having fastened to one of them one end of the chain, he surrounds with it (*i.e.*, the chain) the part to be operated upon, and attaches its free extremity to the other arm, thus enclosing within a loop, as it were, the tissues which he means to divide. Next, he grasps the canula in his left hand so as to hold it steadily, and, seizing the handle with his right, he pulls it towards him till the chain is tightened firmly round the part which it encloses, and, having done this, he examines to see that the chain is applied exactly as he wishes. The chain being correctly applied, and drawn as tightly as possible round the part, the operator holding the instrument, as already described, in his left hand, grasps the handle with his right, and then, by a combined action, steadily draws or raises the one end towards him, while he, at the same time, depresses the other. His object in doing so is to make one of the arms advance towards him, and thus to tighten the ligature by drawing it within the canula. He continues this action till the catch enters into a new serration or nick on the arm he is acting upon,

which is indicated by a sharp sound or click, and is the signal for him to cease his efforts for fifteen or thirty seconds, at the expiry of which interval of time the same manœuvre is repeated, and the other arm caused to make a similar advance. In this way, by a sort of to and fro, or up and down movement of the handle, alternately advancing the one arm or the other, and allowing a pause of varying interval between, the operator must proceed until the chain has cut or crushed its way through the part being operated upon, and entered the canula. The pause is essential to the success of the operation. If, as was shown in an operation on a dog, the pause be either neglected or greatly abbreviated, the wound will bleed as certainly as if it had been made with a knife. The intervals I have mentioned above are those I have always seen M. Chassaignac observe. I believe, however, he recommends, in certain cases, that a minute should be allowed to elapse; and this may be done without rendering the operation very protracted, seeing the ordinary duration of such operations as I have witnessed—removal of the mamma, for example—does not occupy more than from fifteen to twenty minutes. In some of his earlier operations, the interval between each constriction was prolonged to half an hour, the operation, in one case, extending over forty-eight, and, in another, twenty-four hours.

Mode of Action.—In its mode of action, the ecraseur differs from all other instruments. It bears no resemblance to the knife, and is unlike the ligature, inasmuch as it first condenses the tissues, and then effects their division directly by the employment of a mechanical force superior to their resistance, and not indirectly, by inducing the intervention of an intermediate force—ulceration or gangrene—as is the case when the ligature is employed. By means of it all the soft tissues may be divided, but not all with the same facility, the skin, according to M. Chassaignac, being the most resistant. It is chiefly, however, with regard to its mode of action upon the arteries that his experiments are interesting. In operating upon the cadaver, he has frequently isolated one of the larger arteries—the carotid, for example—and, after dividing it with his instrument, has found the divided extremities impermeable to a current of air, though blown through a tube placed in the open extremity with all the force one is capable of exercising. This condition—the complete closure of the vessel—is not, according to M. Chassaignac, a simple phenomenon, but results from the different manner in which the several coats of the artery comport themselves under the action of the ecraseur. He says, the two inner coats are the first to be divided, and that after their division they become folded or doubled inwards upon themselves, so as to project into, and, as it were, plug up the extremity, and render it impermeable. By this division and involution of the inner coats, the outer is left in a measure detached, but, by the continued gradual action of the ecraseur, its calibre is diminished, its walls are made to approximate and ultimately to become adherent, and its canal being thus obliterated, a double security is furnished against the chances of

hemorrhage. These are the results obtained in operations performed upon the cadaver on the larger arterial trunks; but, as in operations on the dead and living body the conditions are as unlike as possible, and especially as it is by no means easy to understand how or why the involution of the two inner coats is produced, it would have been more satisfactory to be able to state what is observed in dissections made after operations performed during life on the lower animals. In so far as I have been able to ascertain, no observations of this kind have been made. When the smaller arteries are isolated on the cadaver, and submitted to the action of the ecraseur, they are not divided, as the larger vessels are, but are drawn like elastic cords within the canula, by the chain, without undergoing division. It is believed, however, that when divided in the mass, they are acted upon just as are the larger arteries.

The wound produced by the ecraseur has been compared to wounds produced by wrenching or tearing, and in one respect—the absence of hemorrhage—they do resemble each other; but they differ altogether in form, and also in the mechanism of their production. In the one case, the wound is produced almost instantaneously, and its surface is ragged and irregular; it is essential to the production of the other that it be made gradually and slowly, and its surface, which is regular as if made with a knife, is, owing to the manner of its production, of the smallest size possible. Certain railway injuries afford perhaps a nearer approach, at least in the mechanism of their production—crushing—though differing wholly in form. I remember admitting as a patient into the Glasgow Infirmary, a railway employee, both of whose legs had been almost quite detached a little way above the ankles, by the wheels of an engine passing over them, and yet there was so little hemorrhage that it was not found necessary to tie a single vessel. In this, however, as in torn wounds, a new element, and one which has a tendency to lessen the chances of hemorrhage, is introduced, namely, the shock resulting from the injury. In these cases, too, secondary hemorrhage is apt to occur—an accident which, it is affirmed, never follows operations performed with the ecraseur.

Nerve tissue can scarcely be said to offer the slightest resistance to the ecraseur, and it would seem, as if by the pressure exercised, the fibres are either soon divided, or become so condensed as to lose their conducting power, for it was remarked in some of the earlier operations performed without chloroform, that though at first the pain was very considerable, it soon became tolerable, or almost altogether disappeared.

The power of the instrument is limited only by the resistance of the chain, and this appears to be made of such strength as to be capable of overcoming the resistance of any mass of soft tissue which may require—at least in ordinary operations—to be divided with it. In one of his lectures, after discussing the possibility of applying the ecraseur in certain midwifery operations, M. Chassaignac placed the

chain of the instrument round the neck of a mature still-born child, and, operating without intermission or pause, he completely severed the head from the shoulders in from two to three minutes.

Operations which have been performed with the Ecraseur.—The various operations which either have been performed, or which it has been proposed to perform, by means of the ecraseur are somewhat numerous. To attempt to describe them all—even if I were able—would be a fruitless task, as several of them are never likely to be performed by any one, except, perhaps, M. Chassaignac himself. I shall limit myself, therefore, in this section, to a description of two or three operations illustrative of the different uses of the instrument, and content myself with merely mentioning some of the others in passing, my object being to give as correct an idea as possible—but still merely a general one—of the applications of the ecraseur in M. Chassaignac's practice.

Probably there is no other operation which M. Chassaignac has so frequently performed with his ecraseur, as the removal of hemorrhoidal tumours. I have seen him remove several. The first steps of the operation, and which have for their object the application of the chain, vary according to the position and size of the tumour. If it occupies only partially the circumference of the anus—if it is situated on one side only—he introduces a forefinger into the rectum, and pressing firmly on the base of the tumour, endeavours as much as possible to render it external; having succeeded in doing this, he places the index finger of the other hand on the outer or cutaneous aspect of the tumour, so as to compress the base between the tips of both fingers, while an attendant passes a strong ligature tightly round, and thus renders it pediculated. This done, the chain is applied, and made to cut its way through in the manner already described. If, however, the tumour is circular—if it surrounds the anus—he employs an instrument composed of six hooked branches or crotchets, which admit of being closed or expanded at pleasure. This instrument is introduced into the extremity of the intestine, and the branches being made to spread out are hooked into the tumour, for the double purpose of bringing it as well down as possible, and also of steadying it while an assistant pediculates its base, by passing a ligature firmly round it. The chain is then applied, and the operation completed in the usual manner. In from ten to fifteen minutes, a tumour of considerable size, and wholly encircling the anus, may be completely removed. During the operation, a little blood, varying in quantity from a few drops to from one to two tea-spoonfuls, may escape, according to the size and vascularity of the tumour. This hemorrhage proceeds either from the wounds made by the hooks employed in seizing the tumour, or it exudes from its surface, rendered congested by the pressure, for on the termination of the operation, the wound, in almost every instance, is literally dry—not a drop of blood oozing from it.

Several operations have been performed upon the tongue, in cancerous affections of that organ. I shall describe them as they were performed upon the cadaver, for I have had no opportunity of seeing them performed upon the living subject. In this, as in the former case, the preliminary steps of the operation vary according to circumstances, according to whether it is the whole or only a part of the tongue which is to be removed. If the former, the tongue is seized with a pair of forceps and pulled well forward, and, at the same time, raised and held in that position by an assistant. The surgeon having made a small cutaneous incision under the chin in the mesial line, and a little way in front of the hyoid bone, introduces through this wound a trocar and canula, which he carries obliquely outwards and upwards, and makes to enter the mouth somewhat to the right of the middle line. This done, he removes the trocar, and having previously attached one end of the chain to a flexible bougie, he introduces it through the canula from below upwards into the mouth, and withdrawing the canula, leaves the chain free. The trocar and canula are again introduced through the same opening under the chin, and made to enter the mouth to the left of the middle line, after which the chain is passed through the canula from above downwards, and attached, after the latter has been withdrawn, to the arms of the ecraseur, and made to cut its way out as already described. In this way the root of the tongue is completely cut across; there remain yet, however, its inferior attachments, but these are easily included in the loop of the chain, when once the base has been divided. The chain is placed over the tongue; made to fall into the wound at the base, and then constricted under the tongue, after which the operation is terminated in the usual manner.

If the anterior portion of the tongue is to be removed transversely, the tongue is seized as before, and drawn out sufficiently well to permit the chain being passed around it, behind the part diseased; this done, it is tightened, and made to cut its way out as in any other case. When it is one of the lateral halves that is to be acted upon, a chain is introduced in the middle line, and at a point posterior to the diseased portion, either by means of a trocar and canula, or a large and strong needle made to penetrate from below upwards. The chain thus introduced is attached to an ecraseur, and disposed so as to cut the tongue longitudinally. A second chain is introduced alongside the one already placed in the middle line, attached to another ecraseur, and disposed so as to cut the tongue transversely. These arrangements being made, the operation is completed in the usual way; and the two instruments being independent of each other, one may be intrusted to an assistant, and both thus acting at once, the operation will be completed in half the time which would otherwise be required. This is what I saw done, but there is no apparent necessity for doing so, as the one section might be made after the other with the same instrument.

M. Chassaignac has twice removed the whole tongue, and partial operations have been performed according to his method by various other surgeons; the results, I believe, have been very satisfactory.

Amputation of the neck of the uterus has been practised by this method, and the ecraseur has also been proposed—I am not sure but it has actually been employed—for the removal of uterine polypi. It is for operations of this sort that the curved form of the instrument is designed, and by means of it M. Chassaignac conceives they may be performed with the uterus *in situ*.

Prolapsus and cancerous affections of the rectum, and fistula in ano, have all been operated upon with the ecraseur. Amputation of the penis, circumcision, the operation for the radical cure of varicocele, are also among the operations in which the ecraseur has been employed, or for which it has been proposed.

It only remains for me now to mention a class of operations—what M. Chassaignac calls mixed operations—which are performed partly with the knife, and partly with the ecraseur. When, as for example, in amputation of the mamma, or removal of a tumour—the part to be divided is voluminous, and there is much skin, M. Chassaignac divides the skin and subcutaneous tissue around the base with a knife, applies the chain of the ecraseur in the wound thus made, and finishes the operation in the ordinary way.

Alleged Advantages of the Method by Ecrassement Lineaire.—In the operations to which it is applicable, the ecraseur, it is affirmed, is in various respects superior to both the knife and the ligature. The knife has the advantage of more rapid action; but the wound made by the ecraseur, owing to the mode of its production, presents the smallest surface possible, and is neither attended with primary nor secondary hemorrhage. There is also less subsequent inflammation, and, as a consequence, less suppuration and more speedy cicatrization. As regards the ligature, it is greatly superior to it, inasmuch as in its action it is more rapid, and, as a consequence, there is the absence of continued pain, less inflammation, less suppuration, and less risk of purulent absorption. In a word, the production without hemorrhage of a wound having the smallest size possible, and which cicatrizes speedily, greater rapidity and certainty of action than the ligature—immunity from all secondary accidents, whether hemorrhage, abscess, erysipelas, hospital gangrene, phlebitis, or tetanus—these are among the principal advantages claimed by M. Chassaignac for his peculiar method. To these may be added, that, by means of it, operations upon the tongue may be performed while the patient is under the influence of chloroform.

Concluding Remarks.—When, after witnessing two or three operations, I first promised to write an account of M. Chassaignac's method of operating, I believed all the positive assertions which were made regarding it, and was carried away by the novelty of the thing, and the advantages which it seemed at first sight to possess. Since that

time, however, my opinions of the method and its alleged advantages have undergone considerable modification, as more extended observation and reflection have enabled me to form a less prejudiced, and therefore a truer estimate of the subject.

While listening to M. Chassaignac dilating on the merits of his ecraseur in a numerous class of operations, one would almost be led to believe that its discovery has left nothing further to be desired in surgery. He magnifies the dangers, and depreciates the merits of all other modes, while, at the same time, he exaggerates the advantages of his own, and seeks unnecessarily to extend its application. The cases in which it is really called for, or legitimately applicable, seem greatly more limited than M. Chassaignac pretends; for example, the fistulous tract of an abscess in the thumb, or, even in ordinary circumstances, a fistula in ano, appear to be cases in which the necessity is small indeed for having recourse to the ecraseur. The insignificance of the operation is, however, no objection to M. Chassaignac's method, though it would probably be a reason with many surgeons for not having recourse to it.

The operation for the removal of hemorrhoidal tumours, shows, as well perhaps as any other, the possibility of dividing vascular tissues without hemorrhage; and if one is content to witness this much merely, and accept all the rest on authority, the operation doubtless seems vastly superior to all others. But there are other things which require to be considered. Is it the case that cicatrization occurs as speedily as is represented? Two or three weeks after the operation, the patient may be still seen in the hospital, with a wound only partially cicatrized: this alleged advantage, therefore, is not invariably obtained. Again, in operations involving the entire circumference of the anus, occlusion of the intestine is apt to occur from adhesion, just as the outer coat of an artery is said to become obliterated by the agglutination of its walls. M. Chassaignac himself admits the existence of this tendency, and counsels the examination of the wound within twenty-four hours after the performance of the operation, and, if need be, the introduction of a pledget of lint or charpie into the extremity of the intestine. This, however, cannot perhaps be regarded as a serious objection, seeing that the tendency is easily overcome; besides, it only exists in circular operations—it is awanting in partial ones. In operations of this sort, too, I think, from examination of the part removed, that I have seen more taken away than was absolutely necessary, the chain apparently, up to a certain point at least, having a tendency, as it is being tightened, to draw within its grasp the more moveable tissues immediately around it. This objection, however, does not apply, or only to a very limited extent, to partial operations, for in these it is possible to pediculate the tumour more effectually than in the more extensive ones. Partial operations are also free from the tendency to occlusion, so that, if the employment of the ecraseur be deemed necessary, it may be affirmed

that its use in these cases, seeing it is unattended with any special risk, will be perfectly legitimate. Before forming an opinion as to the propriety of employing it in circular operations, one would require to know whether the cicatrix which follows its use tends to produce stricture. There seems reason to suspect this; but to solve the question fairly, one would require to know the histories of the cases after their dismissal from the hospital. The existence of this suspicion—the possibility, if not the probability of stricture—coupled with the objections already stated, ought, I think, to make one hesitate to employ the ecraseur for the removal of a hemorrhoidal tumour encircling the anus. For the same reasons, there seems room to doubt the propriety of this mode of operating in prolapsus ani, and also in cancerous affections of the rectum.

Such operations as I have seen performed by the mixed method—partly with the knife, partly with the ecraseur—have in no one instance been calculated to impress me favourably with it. M. Chassaignac pretends that, in operating by this method, there is little loss of blood; because, in making the incision with the knife, it is not necessary to cut deeply, and that, consequently, no vessel of any size being divided, the hemorrhage is inconsiderable. But to put the case thus, is not to put it fairly. It is no doubt very true, that for equal portions of time the hemorrhage from a superficial wound will be less than from a deep one: but if the hemorrhage from the latter be arrested almost immediately, while that from the former is allowed to flow unchecked for fifteen or twenty minutes, it is not difficult to conceive that the loss may ultimately be equal in the two cases; it is even possible that in the protracted one it may be in excess. In order that the tumour or part to be removed by this method be completely extirpated, it is necessary that the chain penetrate as deeply as its base. If the incision with the knife be superficial, while the tumour is deep-seated, it will be impossible to apply the chain properly, and the tumour will be cut across, not extirpated. These—and there are others beside—are not imaginary objections. They are real experiences. In two or three cases in which I saw the mamma removed, the hemorrhage from a wound encircling the base of the gland continued unchecked during the operation, and was by no means inconsiderable. In each case, too, the operation was imperfectly performed, diseased portions remaining, which had to be cut away with the knife or scissors. In another operation by the same method—the removal of a lipoma of considerable size—the results were equally unsatisfactory. Whether, in making the circular incision, the point of the knife wounded the sac of the tumour, or whether it burst from the pressure exercised upon it, it is impossible to say; but from one cause or other the sac gave way, and the portion which remained had to be dissected out. The operation, however, was liable to a still more serious objection. Most surgeons, I think, would have made a linear incision through the skin and subcutaneous tissue, in the long diame-

ter of the tumour, and, dissecting it out, would have brought the edges of the wound together, and endeavoured to obtain their union. M. Chassaignac, on the contrary, with a bistoury, traced a line round the base of the tumour, dividing the skin and subcutaneous tissue; after which, with his ecraseur, he cut away the entire mass, consisting of the tumour and all its covering integuments, leaving a deep wound of three inches or more in diameter to fill up and cicatrize. Which of the two operations would have shown the best surgery, and, at the same time, been the best for the patient, few probably would have had any difficulty in determining.

If, as I have said, M. Chassaignac strains the use of his instrument, employing it in cases in which it is not necessary, and extending it to others to which it is not applicable, so too, as seems to me, does he exaggerate its advantages. It is at least premature with his limited experience —somewhere about a hundred operations in all—and especially considering the kind of operations, to claim for his method all the advantages which he enumerates; and it may, I think, reasonably be doubted whether any amount of experience would ever warrant him in ascribing immunity from erysipelas, hospital gangrene, tetanus, &c., to the use of his ecraseur.

That cicatrization does not occur with any unusual or remarkable rapidity, I have already stated; neither is it easy to find any reason why it should do so. A slough, more or less superficial, forms on the surface of the wound made by the ecraseur, becomes detached after several days, and leaves a suppurating surface, which, it is affirmed, cicatrizes with unusual rapidity. But, as I have already said, this result is not invariably attained, and it is difficult to find a reason why the suppurating surface of a wound made by the ecraseur should heal more rapidly than the suppurating surface of a wound made with a knife, just as it is difficult to understand why an ecraseur-made wound, with its tendency to form a superficial slough, should be attended with less inflammation than a common incised wound.

That the ecraseur possesses all the advantages claimed for it over the ligature, must, I think, be admitted, though it does not follow that the latter is either the useless or the mischievous thing which M. Chassaignac is pleased to represent it. So, too, in so far as absence of hemorrhage is concerned, the superiority claimed for the ecraseur over the knife must be admitted; for it is beyond all doubt possible to divide highly vascular tissues, and even vessels of considerable size, by means of it without loss of blood. On the other hand, its use is limited. That it will ever to any extent supersede the knife, is, I believe, impossible, not because surgeons generally would oppose the introduction of a method so purely mechanical, but because the form and action of the instrument do not admit of its being employed extensively.

In venturing thus to state opinions somewhat at variance with those of M. Chassaignac, I have been careful to avoid inventing objections,

and have contented myself with stating only such things as seemed to be fairly borne out by observation. That in a class of operations necessarily limited, and, for the most part, of rare occurrence—for example, operations such as those described upon the tongue, uterine polypi, removal of the neck of the uterus, or part of it, and one or two others of a similar character—the new method seems not merely legitimate, but in several respects superior to the other modes of operating, can scarcely, I think, be doubted: but that it possesses all the advantages claimed for it, or that it admits of such varied and extensive application as is pretended by M. Chassaignac, I do not believe; and I think this opinion is borne out by the conduct of his professional brethren. He is almost the only person who employs the ecraseur—certainly the only one who employs it generally—but that his method is not regarded as a fanciful novelty, but a really useful invention in certain cases, is evidenced by the fact, that men of the highest surgical attainments—Velpeau, Nelaton, &c., for example—do not hesitate to take advantage of it when the occasion requiring it occurs.—*Glasgow Medical Journal, April*, 1856, *p.* 68.

148.—ON THE ECRASEUR.

By T. Spencer Wells, Esq., Lecturer on Surgery at the Grosvenor-place School.

The action of the instrument, though slower than that of the knife, is much more rapid than that of the ligature, and its action is direct; not indirect like the ligature, which only divides tissues by the process of gangrene it induces. The *écraseur* first condenses the tissues it acts on, and then divides them with extreme regularity. The wound does not appear at all bruised or torn. When it acts on an artery, it first divides the two internal coats, which are folded up in such a manner as to plug the vessel. The closure is assisted by the agglutination of the outer coats, before they are divided, and after separation has been effected, the closure is so perfect that the channel cannot be opened by blowing forcibly through it. Experiments have been made at the Veterinary School near Paris, and the carotids of sheep have been divided without loss of blood. There is nothing surprising in this, when we remember how seldom severe gun-shot, lacerated, or contused wounds bleed, that a limb may be torn off by machinery, and no blood be lost: and that *bites* are very rarely attended by hemorrhage. The lower animals have no occasion to apply a ligature upon the umbilical cord of their young. They simply bite it through, and the action of the *écraseur* is much more like that of biting than of crushing.

My personal experience of the use of this instrument in the living human body amounts only to three operations I saw M. Chassaignac perform—the removal of a portion of the tongue, a testicle, and a

mammary tumour. In the first case, about a third of the tongue was removed, on account of supposed malignant disease. The man was not under the influence of chloroform, and the operation occupied twenty minutes. It appeared to be very painful, although we are informed that the pain is not in general complained of after the first tightening of the instrument benumbs the parts. There was some bleeding, which was explained by the dresser who had continued to tighten the chain, having done so too fast, and by the patient having jerked his head at the conclusion of the operation, and separated the last shreds of the tongue suddenly. A quarter of an hour afterwards I followed the man to the ward, and found him bleeding profusely. I could see a small artery jetting freely at the lower part of the wound. A Sister of Charity was supplying the man with lumps of ice to keep in his mouth; and she told me that, expecting what would happen, she had the ice all ready by the time the man returned from the theatre. She said she had seen a great many of these operations on the tongue, perhaps fifty; that they occurred almost every week, and that there was troublesome bleeding in a large proportion, perhaps about half or rather more; but that ice always succeeded in stopping it.

In the second case a testicle was removed, and not a drachm of blood was lost, though we could see the spermatic artery pulsating very distinctly at the spot where it had been divided. Two *écraseurs* were used in this operation, the chains being passed through an opening made by a trocar in the upper part of the scrotum, above the testis and behind the cord. One divided the cord and integuments horizontally, the other divided the scrotum vertically. Thus a very large portion of the scrotum was removed, and there was not enough left to cover the remaining testicle. It appeared to me that if the *écraseur* were used at all in such an operation, the scrotum should certainly be first divided with the knife, so that none should be lost, and the *écraseur* be merely used to divide the cord.

In the third case I could not understand why the instrument was used at all. A small mammary tumour was to be removed, and to get the chain around it, it was necessary to lay it bare with the knife. Of course the principal vessels were divided in this process, and a very few more touches of the knife would have sufficed to separate the tumour, when the *écraseur* was applied.

I found that of upwards of a hundred operations on piles with this instrument, one had proved fatal. The man was suffering at the time from secondary syphilis.

The impression left on my mind from what I have seen and heard, and from my own trial of the instrument on the dead body and on the arteries of sheep and a calf, is that, if slowly and properly used, hemorrhage will very rarely follow its application, but that its use will most likely be restricted to the removal of piles, polypi, and such erectile or malignant growths as could not be removed by the knife without a probability of dangerous hemorrhage. In such cases the superiority

over the ligature in the time gained, and the non-liability to purulent or putrid absorption is self-evident. Whether it will answer as well as a wire heated by galvanism experience alone can decide.—*Medical Times and Gazette, Oct.* 11, 1856, *p.* 365.

149.—ON ANTIMONIAL POISONING.

By Dr. Richardson. (Read before the Medical Society of London.)

[Dr. Richardson, after carefully reviewing the subject of the effects, physiological and pathological, of antimony, which, when acting as a poison, has usually been considered as exciting certain specific and well-defined symptoms, such as vomiting, spasms, and other signs analogous to those of cholera, proceeds to say,]

But may antimony destroy in a more insidious way? that is the question; and, considering the incredible number of times this drug has been, and is being, prescribed, no question could possibly be more important. Up to the present time experimental inquiries into the effects of antimony have been very limited, and were summed up by the author in a few sentences. The special points which he marked out for a new series of inquiries, ran as follow:—

1. By what surfaces may antimony be received into the body?

2. Its diffusion throughout the system and its election by different organs.

3. The modes of its elimination, and the periods at which it is eliminated.

4. The physiological changes, or, in other words, the pathological conditions to which it gives rise.

5. The modes in which it destroys life when it acts as a fatal poison.

6. The chemical changes which it itself undergoes in the organism, and the special effects of its different preparations. From this point, Dr. Richardson passed direct to the details of experiment, and recorded the particulars of cases in which antimony was administered by injecting it into the cellular tissue and jugular vein; by applying it in the form of ointment to a wound in the skin; by inhalation, in the form of antimoniuretted hydrogen, by injecting it into the jugular vein, and by giving it in small and continued doses by the mouth. From these experiments the fact was confirmed that, when introduced by any of these channels, the symptoms induced were the same. The antimony in every case was freely thrown off in the excretions from the alimentary canal, and was also present in the liver, in the kidneys and their secretion, in the heart, blood, lungs, and other structures. That the society might have points of discussion before it, the author gave the following conclusions, some of which he considered as absolute, but thought that others might be open to modification after a more prolonged research. The paper was copiously illustrated by specimens of metallic antimony, obtained from the viscera of animals which had been

destroyed by this substance; and two animals, carefully dissected, were placed before the Fellows, for the purpose of showing the pathological conditions incident to this mode of death.

Conclusions.—1. That antimony both as regards the symptoms it induces, and the pathological results arising from its administration, excites effects in the dog identical with those which it excites in man; and that experiments on dogs thus afford a fair basis of comparative research.

2. That the skin, peritonæum, cellular tissue, and lungs, all absorb antimony, in its soluble forms, with as much certainty as the stomach; and that whether introduced by any of these channels, or by direct transfusion into the blood through the veins, the diffusion of the poison is equally complete, and its effects specifically the same. Absolute.

3. That after any such mode of introduction, antimony may be detected in the vomited and purged matters, in the stomach and the contents of the stomach, in the intestines and their contents, and in the lungs, liver, kidneys, blood, urine, heart, and even in serum effused into cavities, if such be present. Absolute.

4. That consequently the detection of antimony in vomited or purged matters, in the stomach, or the contents of the stomach, or in the intestines or their contents, can no longer be considered as any judicial scientific proof that the poison was introduced into the system by the alimentary canal at any part, as has been assumed. Absolute.

5. That antimony being absorbed with great rapidity wherever introduced, the point of surface at which it is taken into the system may afford slighter indication of the presence of the poison than other parts of the organism. *Ergo*, that the point of introduction can never be proved by mere chemical analysis. Absolute.

6. That antimony so applied locally as to admit of being rapidly absorbed, seems to excite but little amount of local injury, although it excites marked local effects when brought by the blood to any surface for elimination. *Ergo*, that the appearance of intense redness or inflammation in the stomach, or other part of the alimentary canal, in supposed cases of death from antimony, is no scientific proof, nor yet indirect evidence, that the poison was received into the system by this canal. Absolute.

7. That the symptoms of poisoning by antimony in large doses are, as a general rule, those of vomiting, purging, and rapid collapse, and that the same symptoms, somewhat modified in their course, result from small doses repeated frequently during a prolonged period.

8. That to this rule exceptions occur. To wit, that antimony, when thrown into the system in a large dose, and in such a way as to prevent its dejection, as by direct injection into the veins, may destroy the muscular power so suddenly that the symptoms of vomiting and purging may not present themselves. And again, that when introduced very slowly, as by application to a small wound, it may also de-

stroy by producing simple exhaustion, without the specific symptoms of purgation or vomiting.

9. That in all forms of antimonial poisoning death occurs mainly from failure of the circulation, the respirations being continued after the cessation of the heart's beat.

10. That the pathological appearances incident to antimonial poisoning are (*a*) general congestion; (*b*) marked fluidity of the blood; (*c*) intense vascularity of the stomach in the course of the greater curvature, and in some cases of the rectum and other parts of the canal, but without ulceration; (*d*) a peculiar pale yellow, or an occasional dark glairy secretion on the alimentary surface. Lastly, and contrary to the statements of Magendie, antimony seems to excite no other pulmonary lesion than simple congestion.

11. That the election of antimony by different parts of the body is as yet an open question; that liver, however, would appear to be the structure in which it is most collected when the administration is slow and in small doses; and that the elimination of the poison is attempted by all the secreting surfaces.

12. That in rapid poisoning the fatal effect seems due to direct chemical change in the blood and not an indirect effect therefrom on the heart: while in slow poisoning there is superadded an interference with the assimilative powers, the result of the lesion excites in the stomach or other parts of the alimentary canal.—*Med. Times and Gazette, May* 10, 1856, *p.* 473.

150.—CASE OF POISONING BY CHLOROFORM TAKEN INTERNALLY.

By James Spence, Esq., Lecturer on Surgery, Edinburgh. (Reported by Dr. G. H. Pringle, House-Surgeon to the Royal Infirmary, Edinburgh.)

On the 19th of May last, at a quarter past ten P.M., I was called to see A. B——, aged twenty-one, one of the female servants of this hospital, who, I was informed, had twenty minutes previously swallowed two ounces of pure chloroform. I found her lying in bed, half dressed, in a state of perfect unconsciousness, (apparently in a profound sleep,) from which she could not be roused; her breath did not smell of chloroform. Pupils very much contracted; conjunctiva quite insensible; body of normal temperature; respiration tranquil and regular; pulse 78, soft, and tolerably full; no congestion of face. I immediately ordered sinapisms to be applied to the extremities and over the epigastrium, and having secured the able assistance of my colleague, Dr. Thorburn, proceeded to evacuate the stomach by the stomach-pump, it being impossible to make her swallow an emetic. A delay of nearly ten minutes occurred before the stomach-pump was procured; when it was applied, the matters evacuated had not the slightest odour of chloroform, nor

of opium, which was suspected from the excessively contracted state of the pupils. About half an ounce of mustard was introduced into the stomach, which was again emptied, and then a drachm of aromatic spirit of ammonia, with one ounce of brandy, administered by means of the stomach-pump. Some feeble attempts at vomiting ensued, and the pupils became fully dilated, and continued so for some minutes, but still continued quite immovable when exposed to a strong light. At the same time the beats of the pulse and number of respirations slightly increased in frequency, but shortly after fell below their previous standard. A powerfully stimulating enema was now administered, and, after the lapse of ten minutes, respiration becoming slow and stertorous, the pulse at the same time sensibly flagging, and the face becoming livid and congested, galvanism was resorted to, a free circulation of air being kept up around the patient, and her tongue held forward by a pair of catch forceps to prevent closure of the glottis. The number of respirations, however, continued to decrease, falling so low as seven in the minute, and accordingly an additional pair of plates were added to the galvanic battery, greatly increasing its strength and efficiency, while enemata of beef-tea and brandy were administered frequently. Dr. William Gairdner, one of the visiting physicians to the hospital, had been sent for, and arrived about twenty minutes past eleven P.M. He recommended the administration of a large black draught, which was done by means of the stomach-pump; this produced severe retching and attempts to vomit, during which the patient was repeatedly almost asphyxiated. Keeping up artificial respiration with the aid of galvanism was now evidently our only resource, and this was continued, with occasional short intermissions, for nearly two hours. Stimulating enemata were given every half hour, and warmth applied to the extremities, which became excessively cold. Everything, however, appeared of no avail, and respiration fell to two per minute; the pulse at the wrist became imperceptible, while the face and neck were perfectly livid. At one time, indeed, breathing ceased altogether for nearly two minutes, and the jaw fell. The remedial measures were, however, persevered in, and in about half an hour we had the gratification of perceiving some signs of amendment. Her pulse gradually gained in strength, while her breathing became less embarrassed, *her breath now smelling strongly of chloroform.*—Half-past two P.M.: Pupils became widely dilated, the sensibility of the conjunctiva returning, and the lividity of the face disappeared. Galvanism was now desisted from, although the patient still remained unconscious, all attempts to rouse her being unavailing.—Three A.M.: Bowels very freely purged; pulse 94, gaining strength; respiration 28 per minute; the extremities have recovered their natural temperature.—Half-past three A.M.: Consciousness slowly returning.—Four A.M.: For the first time the patient answered when addressed, and of her own accord opened her eyes. The white of egg beat up with mucilage and warm milk was now cautiously administered, and attendants were directed to watch her carefully.

May 20th. Ten A.M.: Perfectly sensible; pulse 100, soft; respiration unembarrassed, and not hurried in any marked degree; complains of general pain in abdomen, of thirst, and great nausea; tongue moist, but is considerably swollen, and very painful. Hot fomentations applied over abdomen, and she was ordered to have five minims of tincture of opium, every three hours, in half an ounce of mucilage. Has not passed any urine since last night; bladder empty.—Evening: Tongue moist, and still extremely painful; pulse 120, soft and regular; general pain over abdomen; has been severely purged, and a considerable quantity of blood passed by stool; urine passed freely; complains of a dull, aching pain across the loins. To continue the fomentations, have a starch enema containing half a drachm of tincture of opium, and to swallow pieces of ice occasionally.

21st. No return of the diarrhœa; slept a little during the night; pulse 132, soft; tongue furred; thirst excessive; pain is now entirely referred to the epigastrium, and is increased by pressure, which also induced a tendency to vomit; feels drowsy, and pupils are slightly contracted; urine passed abundantly. To apply twelve leeches to the epigastrium, and a sinapism along the spine.—Evening: Much relieved; pulse 130; tongue moist; less drowsy, and free from nausea; diarrhœa has recurred, but not severely. To repeat the starch-and-opium enema.

22nd. Greatly better; pulse 100; complains merely of a general feeling of soreness; has taken a little beef-tea, which was retained in the stomach.

23rd. Doing well; pulse 90, soft.

25th. Is able to sit up, and the following day returned to her work.

I have communicated the particulars of this case from its great interest, being, as far as I am aware, the only one on record of poisoning by chloroform administered internally. The only other case I know of happened also in this hospital, some years ago, when a patient having surreptitiously got possession of a bottle of chloroform, swallowed (if I remember rightly) the enormous quantity of six ounces. The man recovered from the immediate effects of the poison under the use of stimuli and galvanism, but died in great agony, within forty-eight hours, with symptoms of acute gastritis. When first called to the present case, I should certainly have thought it a case of poisoning from opium, had I not been shown the bottle which had contained the chloroform; the contracted state of the pupils, coupled with the patient's complete insensibility, strongly resembled the effects produced by the former drug. The diminution of the frequency of respiration, however, was not proportionate to the amount of stupor. The indications for treatment were evidently to sustain the flagging vital power by stimulants and galvanism, but I am doubtful of the propriety, in such cases, of administering alcoholic stimuli, which might tend to ag-

gravate the symptoms; and should I ever meet with a similar case, I should trust more to the preparations of ammonia, as we are, I think, justified in supposing that chloroform, to a certain extent at least, acts by causing an excess of carbon in the blood, which would be still further increased by the administration of any form of alcohol. In fact, the patient's condition was precisely that of extreme drunkenness. It is worthy of notice, that although certainly not more than forty minutes elapsed from the time the chloroform was swallowed till the stomach was evacuated by the stomach-pump, no smell of chloroform was appreciable in the contents of the stomach. This could have arisen only from extremely rapid absorption of the poison, or from its having quickly passed into the small intestines, and been thence absorbed more gradually. The latter supposition is favoured by the fact that a strong odour of chloroform was perceived in the patient's breath when she began to rally from its effects, nearly four hours subsequently to its administration, although it could not be detected before. It was from a consideration of this kind that Dr. Gairdner prescribed an active cathartic, in hopes of emptying the intestines of their noxious contents.

It is still a disputed point, whether the action of chloroform on the nervous centres affects primarily the respiratory or circulatory systems. The former is maintained by Mr. Bickersteth, of Liverpool, who has supported his arguments by several interesting and carefully-conducted experiments; while in the case of death from inhalation of chloroform recorded by Dr. Dunsmure, the heart appeared to cease to beat before the respiratory movements were suspended; and a similar observation was made in the case lately published by Dr. Mackenzie, of Kelso. In the case before us, the heart and lungs seemed to flag *pari passu*—certainly the radial pulse disappeared before respiration was entirely arrested, but unfortunately at the moment it was not observed if the heart had likewise stopped.

The successful result of this case may serve to encourage medical men to persevere, even against hope, under similar circumstances, in continuing their exertions. Mr. Lowe, two or three years ago, published a case of inhalation, in which respiration and the heart's action were arrested for fully four minutes when under continued artificial respiration; the *pulse first* slowly reappeared, followed by a return of the natural respiratory movements.

In cases, however, where chloroform has been swallowed, it is not only the immediate effects of the drug that we have to fear, and this is well exemplified in the instance of the patient already quoted, who died from the subsequent inflammation set up. Fortunately, in the present case, the symptoms of the secondary danger were never very severe, and were easily controlled by mild remedies.—*Lancet, Aug.* 9, 1856, *p.* 159.

451.—CASE OF UNSUSPECTED POISONING BY LEAD.

By Dr. James Tunstall, Bath.

[The following account is given by the patient himself, a military officer of rank and distinction, in a letter to Dr. Tunstall:]

"In looking back for a period of *three years*, or even more, I am aware of a weakness in the legs and feet, causing a difficulty in getting over stiles, and in mounting on horseback; also a great tendency to trip over slight obstacles on the ground, in consequence of which I have had some heavy falls. About the same time, my arms began to lose their muscular power; first the left arm, then the right, as I remember by the gradually increasing difficulty of raising the bow to the proper height in practising archery; at that period I was subject to a feeble or intermittent pulse, accompanied by anxious feelings, and a very unpleasant sensation about the heart; but I am now quite free from these.

"There has never been any pain in the feet or legs, but about two years since the shoulders began to feel pain in certain positions, and when pressed upon; but never at rest, unless, as before observed, when pressed upon. The pain gradually diminished in the left arm, until about eight months since, when it completely left me, and the left arm and shoulder are quite free from pain. Pain then commenced in the right arm, but has much decreased during the last month, and is now almost gone from that shoulder also. As the pains diminish, the muscular power leaves the arms, which are much wasted, more particularly the deltoid muscles, the pain and weakness being increased by damp cold weather. I can feed myself, although with considerable difficulty. I can shave, holding the razor with both hands, and am able to dress and undress (not without difficulty), except putting on my coat. These notes are a proof that I can write.

"I am in my sixtieth year. My early habits of life were out of doors; I was fond of field sports, but, for the last fourteen years, my life has been more sedentary, with very considerable mental exertion, and much anxiety of mind. I have much dyspepsia, with pain in the stomach, occurring during the night, which is generally relieved by bicarbonate of soda; sometimes, but much more rarely, this pain occurs after breakfast. For the last month I have been quite free from dyspepsia, and feel no discomfort or annoyance in the stomach. All the functions are now performed regularly and well, and I also sleep well. I have consulted several medical gentlemen, but they are divided in opinion as to its nature, one considering it cerebral, another spinal, another articular rheumatism, &c."

[Dr. Tunstall was inclined to attribute these symptoms to dyspepsia in the first place, but on examining him, there was no difficulty in diagnosing the case as one of lead poisoning, although many of the symptoms were absent:]

There was the characteristic blue line on the gums, the whole muscular structure was wasted from the scapulæ to the forearms, with a clammy coldness, and general want of power (feeling remaining perfect), and a total absence of spasm or contraction. The left hand was colder than the right, and slightly arched on its dorsal aspect; the thumb was wasted, and arched towards the palm.*

It was clearly one of those cases in which, as I pointed out in my work on the Bath waters, an error in diagnosis might easily be made; and to make sure of my own, I tested the urine of my patient, and found sulphuret of lead with the hydrosulphuret of ammonia, a test well known for its extreme accuracy, and the facility with which it may be applied to suspected fluids. With my concurrence, my patient transmitted, twelve days after leaving home, ten ounces of urine, and two bottles, each containing the same quantity of his usual drinking water, the one boiled, and the other fresh, to Mr. Herapath, whose report I subjoin:—

"I have analysed the contents of the three bottles forwarded, and I have found lead in all three of them. In the water from the boiler, there is also a trace of iron. Lead is in such quantity in the two waters, that I have no doubt that they will produce symptoms of lead poisoning, perhaps in numbness, and stiffness of the extremities, or in 'lead colic,' loss of appetite, constipation, atrophy, palsy, or paralysis, in fact, it is difficult to say in which form its effects will appear. The trace in the urine is very slight."

Remarks.—I believe this to be the first case on record in which chemistry has been applied to, by an analysis of the urine, to confirm a physical diagnosis in a case of palsy: it was highly important that this course should be adopted, because—from the variety of opinions formed of the nature of the case, the absence of many of the recognised symptoms of palsy from lead, the non-existence of the peculiar colic, and the age and great mental occupation of the patient at the period of invasion—the suspicion that lead was the cause of the mischief was not entertained, although other persons in the locality who had partaken of the same water had the ordinary and easily recognised forms of lead disease.

Tanquerel, in his highly interesting treatise upon 'Lead Diseases' mentions 102 cases of lead paralysis, of which 40 were not preceded by colic: a fact worthy of observation in reference to the present case. I conceive that where a gradual loss of power takes place in the upper extremities, with a symmetrical loss of substance, without any impairing of the sensibility of the limbs, or any evidence of cerebral mischief, we should look to lead, or some other mineral, as the cause of the disease, and I am inclined to think that the term paralysis has been

* The limbs are pendant on the side of the body; if raised, they fall like inert masses, obeying the law of gravitation. In consequence of the permanent contraction of the pronator muscles, and especially of the flexors, the hand becomes rounded, and the back of the hand arched. (*Tanquerel.*)

wrongly applied to these cases. I would restrict paralysis solely to express a disease having its origin either in the brain or spinal marrow, and apply the term atrophy to those cases in which there is loss of power with loss of substance, and which are distinct in their invasion and seat from the true paralytic affections. This is a point which has not been been sufficiently insisted upon by systematic writers; and hence the difficulty of diagnosis in cases which (except where the profession of the patient points to the cause of the disease) embarrass the practitioner in the formation of a correct diagnosis. In lead atrophy, the loss of power is dependent upon want of muscular structure, caused by gradual absorption, or rather by the want of healthy nutrition, producing an atonic condition of the nerves of motion; hence its invasion, unlike true paralysis, is gradual instead of sudden; the limbs are flaccid instead of spasmodically contracted, and remain very much in the same condition both night and day: in genuine hemiplegia the hand may at times relax from spasmodic closure, or *vice versa;* while, in atrophy from lead, no such phenomena are observed. Hence, in the disease now under consideration, the whole of the natural motions of a limb may be produced by the assistance of the hand of an attendant, while in genuine paralysis they cannot be in any degree simulated; hence, we have a good diagnosis of a disease of rare occurrence, except among particular trades, and even more rare in the individual experience of members of the profession.

I have had a large experience in the treatment of the chronic form of lead atrophy, having had under my care, since I came to Bath, 236 cases, of whom 219 were either cured or greatly relieved by the Bath thermal treatment. The treatment of my patient consisted of thermal baths, electricity, and frictions, under which he improved; when, at the end of six weeks, his leave having expired, he returned to duty, shortly after which he was attacked with the furuncular epidemic, so that I am unable to state the progress of his case since March 19th, which I had hoped to do; for cases like this generally require some considerable time before any great symptoms of amendment are visible.

I have only to remark, in conclusion, that where lead, in minute quantities, exists in the ordinary water drank by the patient, the gradual invasion of the symptoms may mislead the most careful practitioner. Lead appears, in these cases, gradually to poison the blood, without producing any of the symptoms of colic; indeed, Tanquerel observes, that "when lead preparations have been introduced and absorbed in the system, they may show their deleterious influence directly by encephalopathy, an apyretic neuralgia of the encephalon," and, producing symptoms of mental alienation, mislead the practitioner. Among the lead diseases he enumerates, are found arthralgy, paralysis, and encephalopathy, each of which may occur independently of the more recognised form of colic. Thus I have I think, written enough at present to show that a number of diseases, preserving their indivi-

dual characteristics, may put on appearances which may mislead even the best men in the profession, unaccustomed to observe them as directly arising from the introduction of lead into the alimentary canal.—*Association Med. Journal, May* 10, 1856, *p.* 377.

152.—*Electro-Chemical Mode of Testing for Arsenic.*—We append a brief extract of Mr. E. Davy's highly interesting and valuable paper upon this subject, published in the 'Journal of the Royal Dublin Society, No. 2,' and we regard it as a convincing proof of the usefulness and necessity of publishing this journal, that this very process of Dr. Davy's, although brought before the notice of the society so far back as 1830, entirely failed to obtain such attention as it deserves, and had fallen into almost complete neglect; for inferior methods of treatment having been much better received, simply from their reaching the public through eligible modes of publication. We are quite sure, from the character of the papers which have already appeared in the Journal of the Dublin Society, that it has already taken and will continue to hold a first place in the ranks of scientific literature, and that such neglect as Dr. Davy has a just right to complain of will not again be so liable to occur.

Dr. Davy's process is adapted to detect arsenic in all its states of combination, and in various organic mixtures; and it is a strong recommendation of it, that it obviates, in many instances, any troublesome or tedious manipulations. It essentially consists in depositing the arsenic in a metallic state upon a surface of platinum (as a platinum capsule or a sheet of that metal) by touching the spot with a rod or thin slip of zinc, and maintaining the contact for a few seconds, when the metal arsenic falls as a film, more or less thick in proportion to its amount, and adhering firmly to the platinum, whence it can be removed by heat or acids, and subjected to any further tests that are desirable.

To prepare the solution for testing, some pure muriatic acid must be previously added; and when the fluid is very dilute it is then to be concentrated by boiling before using the electro-chemical test. After the concentration, which may be carried to a considerable extent with advantage, it is well to add some more muriatic acid before testing. Sulphuric acid appears, from some experiments, not to interfere with the result, but nitric acid did. "There was some difficulty in exhibiting the arsenic."

In testing such arsenical compounds as realgar and orpiment, arsenical pyrites, &c., they require first to be acted on by nitric acid to dissolve them, and then all excess of this acid, either exhaled by heat or neutralized previous to adding muriatic acid and testing, as a minute quantity of nitric acid retards the reduction of the arsenic or redissolves it.—*Dublin Hospital Gazette, Sept.* 1, 1856, *p.* 236.

153.—ON THE PHYSIOLOGICAL EFFECTS OF STRYCHNIA AND THE WOORALI POISON.

By Dr. F. W. Pavy, Guy's Hospital.

[The strychnos nux vomica, and the strychnos toxifera, belonging respectively to East India, and British Guiana, and associated together in the same botanical order, yield materials producing exactly opposite effects upon the animal frame. The one excites and leads to muscular contraction, whilst the other depresses and leads to muscular paralysis. Under the influence of both the heart remains perfectly free.

Strychnia, when introduced into the system, produces first a trembling of the limbs, the animal is next unable to support itself, it is thrown into general convulsions, in which its head is forcibly drawn back, and the respiration for the time being suspended. The paroxysms recur rapidly and become longer, until finally the respiration is suspended a sufficient length of time to occasion death. Immediately after death, the muscles relax, and the extremities are flaccid, but in from half an hour to an hour's time the limbs are rendered perfectly stiff.]

Many suggestions have been made as to the immediate cause of death from this energetic poison. Experiment on the lower animals, and observation on the human subject, leave no doubt that it is absorbed into the circulation, and produces its effects upon the muscular apparatus through the medium of the spinal system, leaving the functions of the brain, and probably of the sympathetic system, unimpaired. We observe the intellectual faculties remain clear in the human subject, and the effects of strychnia are manifested to an equal extent in a decapitated frog as in the unmutilated animal,—showing, that the brain remains exempt from the specific effects of the poison. As long as the spinal marrow and the nerves in communication with it are intact, the tetanic condition is produced; but as soon as the former is crushed, or the latter are divided, the effects immediately subside; thus showing that it is not on the muscles or nerves, but on the spinal cord, that the spasmodic convulsions depend. The action of the heart continuing, as we shall presently see, and also the peristaltic action of the intestines, leaves it probable that the sympathetic system is unaffected.

Strychnia, then, although its visible effects are manifested by the muscular apparatus, yet the muscles are not primarily affected, but owe their contraction to the altered functional condition of the spinal portion of the nervous system; and such muscular fibres, as those of the heart, which are not under the immediate control of the spinal system, remain uninfluenced by the poison. Whilst, therefore, the muscles of respiration, which are supplied by the spinal nerves, are firmly fixed with spasm, the muscular fibres of the heart continue alternately contracting and relaxing, provided the circulation through

the lungs be maintained by artificially sustaining the respiratory process.

In reptilian animals, as the frog, where the circulation is not so dependent on the respiration as it is in the higher warm-blooded classes, the heart will continue uninterruptedly beating for many hours after life has been otherwise rendered extinct. Place, in fact, a little strychnia underneath the skin of its back, and in a few minutes the frog will become perfectly rigid with spasm; open the thorax at once, or wait some time until the animal is motionless and appears perfectly dead, and you will still find the heart beating with its ordinary regularity, as will even be the case for several hours afterwards. You may make, indeed, the heart the means of introducing the poison into the system, and it will still remain totally unaffected. I one day made an incision into the upper part of the abdomen of a frog; and after raising the sternum with a pair of forceps, snipped the pericardium, and laid a small portion of strychnine, in powder, on the surface of the heart. In four minutes the animal was rigid with spasm, but on looking at the heart it was acting as usual, as it was two hours afterwards when it was again observed, the life of the frog, in other respects, appearing extinct. I had an opportunity of showing this experiment to M. Ludovic, of Paris, and Mr. Holden, of Bartholomew's, who paid a visit to my laboratory at the time I was performing it. Where different results have been obtained (*vide* 'Lancet,' June 14th, 1856, p. 649) by applying strychnia in solution to the heart, the cessation of its action has depended on the nature of the menstruum employed. A little acetic or hydrochloric acid, with or without strychnia, will soon cause the pulsations of the heart to cease, giving it a shrunken or contracted appearance.

As strychnia produces no effect on the heart in the frog, it may be presumed that this organ has a similar immunity in the warm-blooded animal. This, however, is much less easily shown, on account of the intimate dependence of the circulation on the performance of the respiratory function. When the muscles of respiration are spasmodically fixed, a check is given to this process, which arrests the transit of the blood through the lungs, and in this way leads to a stoppage of the circulation and of the heart's action. To allow the circulation to continue, it is necessary to perform artificial respiration. But, here again we meet with a difficulty, for the muscles of the chest and belly are so fixed, that our attempts at alternately inflating and emptying the lungs, fail, unless we lay open the thoracic cavity. In the number of the 'Lancet' already referred to, Dr. Harley seeks for a satisfactory explanation of the manner in which strychnia destroys life, rejecting asphyxia from spasm of the respiratory muscles, because he did not succeed in maintaining life by means of the artificial respiration he employed. In my own experiments I have found it impossible to *succeed in performing artificial respiration*, unless the influence of the *strychnized* muscles be removed by opening the chest, and allowing the

lungs to collapse to effect the expulsion of the air they contain, as in the natural expiratory action.

Woorali Poison.—Like strychnia, the Woorali poison has no effect on the heart; but it is diametrically opposed in its action on the voluntary muscles; producing paralysis instead of spasm.

It is a most interesting fact, that a single experiment is sufficient to show that the paralyzing effects of the Woorali depend upon a destruction of nervous energy, and not upon a loss of muscular power. We are told by some physiologists that a muscular power *sui generis* does not exist, but that the force of muscular contraction is derived from the nervous system. Now, an experiment with this poison at once contradicts this doctrine, and establishes irrefutable evidence of a force inherent in the muscles themselves. If a frog be killed by decapitation or any other ordinary method, and the crural nerves exposed, an interrupted current of galvanism immediately excites a powerful movement of the extremities. If, however, the frog be poisoned with the Woorali, and the crural nerves be similarly exposed, no amount of galvanism or of mechanical irritation is capable of exciting the slightest muscular movement; but if the galvanism be applied to the muscles themselves, an immediate and strong contraction takes place.

The following are the details of an experiment on a dog, with the Woorali poison, in which the heart's action was maintained by artificial respiration, and which the students of Guy's will remember my performing before them on the theatre table, after one of my lectures during the summer session.

A four or five months' pup was inoculated with the poison, by introducing a small quantity in solution under the skin of the back. In about twenty minutes' time it began to appear weak on its legs, which soon gave way under it, when it attempted to walk or stand. It now lay unable to get up, and, as was to be expected, never manifested the slightest sign of spasm or convulsion; indeed, its legs were perfectly flaccid. Its respiration becoming difficult and slowly performed, a tube was ligatured into the trachea, and artificial respiration resorted to, which was easily accomplished, on account of the free mobility of the chest. When all power of natural breathing had ceased, and the animal appeared dead, the chest was laid open and the heart exposed. Artificial respiration being maintained, the action of the heart was kept up, as in the case of the experiment with strychnia, for full twenty minutes, when it was allowed to cease. An interrupted current of galvanism applied to the pneumogastric nerve had no power, like in the dog under the influence of strychnia, of checking the action of the heart by inducing spasm; because, as we have seen, the capacity of the nervous system was entirely destroyed by the influence of the poison.—*Guy's Hospital Reports*, 1856, *p.* 409.

154.—ON THE PHYSIOLOGICAL ACTION OF STRYCHNIA.

By Dr. George Harley, Teacher of Practical Physiology and Histology in University College, London.

[The manner in which strychnia destroys life is still an open question. Some authors say that it is by exhaustion; others, by asphyxia, induced by spasmodic closure of the glottis; or by spasms which affect the respiratory muscles. None of these views appear to be satisfactory. From the following experiments we must leave our readers to judge as to their correctness or incorrectness.]

Into the thoracic cavity of a dog I inject half a grain of the acetate of strychnine; you observe, he at once begins (in thirty-six seconds) to become tetanic. The eyes are starting from their sockets, and the pupils are widely dilated; the spasms cease (in one minute and a-half); the limbs become relaxed; there is no perceptible pulse; no respiration can be detected; (the thorax of the dog was speedily opened); the heart is seen to quiver feebly but twice; it has now ceased to beat, and the animal is dead. What has been the cause of death? Certainly not exhaustion: the number of spasms and their duration—two minutes at most—preclude this idea. Let us proceed to test on another animal the value of the two remaining theories regarding the mode of death by strychnia.

In order, in the first place, to determine if animals poisoned by strychnine die from suffocation, in consequence of closure of the glottis, I shall perform tracheotomy, and introduce a wide tube into the windpipe of a dog before poisoning him. If he dies, it is clear that death cannot possibly result from air not entering the trachea, as the opening in the tube will admit an abundant supply. (Experiment suggested by Professor Sharpey.) If the animal exhibits signs of approaching death in spite of the complete freedom of the passage for the admission of air into the lungs, I shall immediately supply to those organs, by means of an artificial respirator invented by Dr. Marcet, the amount of air necessary for the maintenance of life. This will determine if the symptoms of suffocation are caused by spasm of the respiratory muscles. If the animal dies, in spite of the artificial respiration, we shall have obtained proof that strychnine does not suffocate by spasm of the respiratory muscles, and shall be forced to seek another explanation of the cause of death. [The trachea of a full-grown small dog was laid bare, and a glass tracheotomy-tube of large calibre inserted into it, without appearing to cause the slightest inconvenience to the animal. The jugular vein on the right side was next dissected from the surrounding tissues, and a solution containing one-twelfth of a grain of acetate of strychnine carefully injected into the vessel. In four seconds, before the nozzle of the syringe could be removed from the vein, the animal became tetanic, the spasms rapidly following each other, and during the first thirty seconds gradually increasing in intensity. The convulsions of the voluntary muscles of the limbs and of the semi-voluntary

muscles of respiration were not continuous. On placing the hand in front of the tracheotomy-tube, the air was felt to be expired by sudden jerks, and, from the frequency of the respirations and the force with which the air was expelled, the animal seemed to breathe more than in his normal state. In fifteen minutes, when the animal began to gasp as if for air, notwithstanding that an abundance seemed to be supplied, artificial respiration was resorted to, and not interrupted until the gasping ceased and the animal appeared more easy. The pulse was 104, and the artery felt at times to the finger as if affected by spasm. There was no lockjaw. As the gasping returned, artificial respiration was again kept up for a few minutes. The animal again appeared relieved, but in a very few minutes symptoms of impending suffocation recurred. The artificial respiration was this time found to be unsuccessful. Twenty-eight minutes after the administration of the poison the pulse ceased; and though artificial respiration was kept up during nearly a quarter of an hour, it failed to restore the animal to life.] The experiments made prove that death from strychnine may occur independently, 1st, of exhaustion; 2nd, of asphyxia from closure of the glottis; and 3rd, of suffocation from spasms affecting the respiratory muscles.

It was a remarkable circumstance in the case of the last animal operated upon, that while a large interchange of gases was constantly occurring in its lungs, it presented all the appearance of an animal dying for want of a sufficient supply of air. This must have arisen from the fact that the oxygen in the lungs was either not absorbed into the blood, or not assimilated after absorption. The absorption of oxygen by the blood being a purely physical process, we must, in the absence of any reason for its non-absorption, set the first hypothesis aside. The second seems less open to objection, particularly if we consider the results of some experiments which I made on the action of strychnine upon the blood. I found that strychnia, as well as brucia, possessed the property of diminishing the power of the constituents of the blood to take up oxygen and yield carbonic acid. For example:—

Experiment 1.—A certain quantity of fresh calf's blood was first shaken with renewed portions of air until it had become thoroughly saturated with oxygen, then introduced into a graduated glass vessel with 100 per cent. of ordinary air, corked carefully up, and kept during twenty-four hours in a room of moderate temperature. In order to favour the mutual action of the air and blood, the vessel was frequently agitated. At the expiration of the twenty-four hours, the gas was analyzed by Bunsen's method, and the following was found to be its composition. In 100 parts—

Oxygen	11·53
Carbonic acid	5·96
Nitrogen	82·71
	100·00

A second portion of the same blood, to which 0·005 grams of strychnine were added, was confined with the same quantity of air, for the same time, and treated in every respect in a similar manner. The gas yielded in this case—

Oxygen	17·82
Carbonic acid	2·73
Nitrogen	79·45
	100·00

On comparing the result of the first analysis with the composition of the common air (oxygen 20·96, carbonic acid 00·002, nitrogen 79·038) which had been introduced into the vessel, it is seen that 9·63 oxygen had disappeared, and 5·96 carbonic acid now exists where only a trace of its presence could be detected. In the second experiment, where the strychnine was present in the blood, no more than 3·14 oxygen had disappeared, and only 2·73 of carbonic acid had formed. Thus it is seen that strychnine possesses the strange property of preventing the constituents of the blood from absorbing oxygen and exhaling carbonic acid, and of thus becoming fitted for the purpose of nutrition. Strychnine is not the only alkaloid obtained from the nux vomica possessing this power; for brucia I found to act in a similar manner, though its effects were less marked. For example: a certain quantity of blood from another calf was confined with the same quantity of air, and treated in exactly the same manner as in the foregoing cases. At the expiration of twenty-four hours the analysis of the gas confined with the pure blood yielded—

Oxygen	6·64
Carbonic acid	3·47
Nitrogen	89·89
	100·00

While that confined with blood to which had been added 0·005 grams of brucia gave—

Oxygen	11·63
Carbonic acid	2·34
Nitrogen	86·03
	100·00

Thus proving that brucine, like strychnine, possesses the property of diminishing the power of the organic constituents of the blood to unite with oxygen and give out carbonic acid.

If the same action takes place in the blood circulating in the living animal as we here find to have occurred out of the body, a direct explanation is at once afforded us why the dog upon which we experimented should feel a want of oxygen, notwithstanding that a quantity sufficient to support life in the healthy condition of the animal was supplied. The animal, probably, was dying, not for want of the pre-

sence of a sufficient quantity of oxygen in its blood, but because the constituents of its blood could not assimilate the oxygen. The convulsions would not, in this case, be caused by the stimulating effect upon the spinal cord of an excess of carbonic acid in the blood; for strychnine and brucine, we have seen, acting upon blood removed from the body, cause its constituents to absorb less oxygen and exhale less carbonic acid than in a normal state. There would be therefore no excess of carbonic acid. The convulsions were probably due to disordered nutrition: the spinal cord receiving nutritive materials which, not having undergone the oxidizing process, were unfit for assimilation. A derangement of the functions of the nervous system would be the result.

Post-mortem Examination of the Dog killed by one-twelfth of a grain of strychnine, made twenty-four hours after death.—Rigor mortis had disappeared (it was very marked eighteen hours after death); the apex of the heart felt excessively hard, as if the muscle were in a state of rigor mortis: the right side of the heart was full of blood, the left side contained but little. Contrary to the general idea, the blood was found partly coagulated. No other appearance worth noticing was presented.

May not death have occurred by failure of the heart's power? It is generally supposed that venous blood excites the heart's action. I think, on the contrary, that the beatings of the heart are excited by the act of nutrition—i. e., by the stimulus given when oxygen is absorbed and carbonic acid exhaled. For if we put a frog's heart into an atmosphere of oxygen, it continues to beat for a very long time, whereas if it is placed in carbonic acid, the pulsations cease in a few minutes. With the cessation of the chemical changes, for the want of oxygen, the beatings of the heart are arrested.

In frogs suffering from the effects of strychnia, the heart remains almost to the last free from tetanic spasm. In this frog you will observe, although the voluntary muscles are affected with severe tetanic spasm, the involuntary muscles of the heart continue to act rhythmically. This small quantity of solution of strychnine, however, which I drop upon the organ, will soon produce tetanic spasm of its muscles. I saw Professor Arnold perform this experiment. I am not aware of its being published.) The circulation, in the web of a frog's foot, seen through the microscope during the tetanic spasm, is observed to be momentarily arrested during the spasm, and then to bound onwards with a sudden jerk.

Here is a frog which was poisoned with strychnine two days ago. While the tetanic paroxysm was very severe, 1-500th of a grain of Wourali poison was introduced into the cellular tissue. In ten minutes the limbs had become perfectly flaccid, and no irritation induced a spasm. Two hours afterwards, conceiving the animal to be perfectly dead, I opened it, and was astonished to find the heart beating rhythmically. The next day, the heart was found still beat-

ing and the circulation in the web of the foot slow, yet regular. Galvanism applied to the limb accelerated the circulation. Up to the present moment (59 hours) the animal has not presented the slightest sign of life; and yet you see circulation continues.*

I have already mentioned, that I consider the physiological test the most reliable one for strychnine; and the method of applying it appears to be by injection into the thoracic or abdominal cavity. When the poison reaches the lungs, it seems to act most speedily. This is easily explained by the rapidity with which the poison will be absorbed into the blood through the pulmonary capillaries. Into this small frog I inject 1-2000th of a grain of acetate of strychnine; into this other 1-4000th. You may judge by the rapidity with which the symptoms of poisoning will ensue, how delicate the tests are, (both frogs became tetanic in less than ten minutes). A third frog became tetanic with only 1-8000th of a grain.

In order to apply either the physiological or the colour-test to strychnia, we must first have the substance in a pure state. If therefore, we wish to test for its presence in the digestive canal, tissues, or blood, we must first seek to separate the strychnine by a chemical process. The method I adopt, and which appears to me desirable from the ease and rapidity with which it can be applied, I shall now demonstrate to you in analyzing the blood of the dog killed with 1-12th of a grain. We take the blood from the heart and large vessels, mix it with twice its bulk of distilled water, coagulate by boiling, and acidify it with a few drops of acetic acid. The acid is added for two reasons:—first, to ensure the complete coagulation of the albuminous compounds: secondly, to retain the strychnine which had been introduced into the blood as an acetate, in that state, or, if changed into another salt, to retransform it into an acetate. Our next point is to decolorize the blood; and that can be most rapidly and most effectually done by filtering it, as is now done, through crystals of sulphate of soda,—this idea, as well as that of decolorizing the blood by boiling it with sulphate of soda, belongs to Professor Bernard,)—or through animal charcoal. The clear filtrate is now to be concentrated, and the strychnine precipitated by the addition of potash, (which, by com-

* Wourali and strychnine have, I find, the effect of reciprocally neutralizing each other, according as the one or the other poison is in excess. Being occupied with experiments on the subject, I shall only cite three;—

1st. A frog was poisoned with 1-500th of a grain of Wourali. Three minutes after he had become perfectly insensible 1-120th of a grain of strychnia was injected. In five minutes he became tetanic.

2nd. A frog was poisoned with 1-120th of a grain of strychnia. Three minutes after tetanus was strongly marked, he was punctured with 1-500th of a grain of Wourali. In seven minutes tetanus disappeared.

3rd. 1-500th of a grain of Wourali, and 1-40th of a grain of strychnia, were injected into the abdomen of a frog at five minutes past one; at ten minutes past, it became very tetanic; at half past one (twenty minutes afterwards) it became perfectly flaccid; and the next day it appeared perfectly well. This is the more astonishing, as the dose of strychnia in this case was certainly more than sufficient to kill it. Thus, it would appear that strychnine might be used as an antidote for Wourali, and Wourali for strychnine.

bining with the acetic acid, sets the strychnia free.) The strychnine is next to be collected on a filter, washed, and redissolved by acetic acid. When thus purified, the physiological test to be applied in the manner already pointed out. In the blood of the dog poisoned by 1-12th of a grain of acetate of strychnine none of the poison was detected in the blood.

Postscript.—Since the foregoing notes were in the hands of the printer, I have made several experiments, and found the following important results:—

1. *Value of the physiological test.*—Into the lungs of a very small frog was injected a solution, containing only 1-160000th of a grain of the acetate of strychnine, (equal to about 1-180000th of the pure alkaloid;) in nine minutes and a half the animal became violently tetanic, and died in two hours.

2. Strychnine *does not* prevent the blood of animals coagulating after death: in some cases it even appears to hasten that result.

3. Death is ushered in by flaccidity of the voluntary muscles.

4. The pupils dilate during the spasms, and contract in the intervals, especially if the latter are well marked.

5. The flesh of animals killed by minimum doses of strychnine does not poison other animals—at least, I have fed a hedgehog on poisoned flesh during fourteen days without being able to detect the slightest symptom of poisoning. The poison must, therefore, have been either decomposed, or not present in sufficient quantity.

6. In animals poisoned by strychnine, the pulsations of the heart cease, notwithstanding artificial respiration being regularly kept up; but after a longer period than when no artificial respiration is employed.

7. In cases of poisoning by strychnine the muscles of the heart rapidly lose their irritability.

8. When animals are killed by large doses, the heart almost instantly loses its power of contraction, and mechanical or galvanic stimulus soon fails to re-induce it.

This can be explained by the following experiments:—

9. If the hearts of two frogs be removed from the body, and one placed in pure distilled water, the other in a solution of acetate of strychnine, the former will pulsate regularly for more than an hour, the latter will cease to beat in from one to five minutes, according to the strength of the solution of the poison. Rigor mortis speedily supervenes.

10. When the hind-legs of a frog prepared after Galvani's method are placed in separate vessels, one containing simply distilled water, the other a strong solution of the acetate of strychnia, the muscles of the former limb will continue to contract when galvanism is applied, either directly to the muscles themselves or through the medium of the nerves, long after those of the limb suspended in the poison have lost

their contractile property, and perhaps even passed into a state of rigor mortis.

It would thus appear that strychnine has the power of directly destroying muscular irritability.

Valentin and others have shown that the lower extremities of a frog, when freed from the skin, absorb oxygen and exhale carbonic acid in definite proportion so long as muscular irritability continues, and have also pointed out that when irritability ceases, an important change takes place in the amount of oxygen absorbed and carbonic acid exhaled. In my experiments on the blood, strychnine was found to destroy the property possessed by the organic constituents of the liquid to absorb oxygen and exhale carbonic acid. May strychnia not act in a similar manner upon the muscles and other tissues of the body? Upon this supposition we can easily explain why the heart ceased to pulsate, and the voluntary muscles to respond to the stimulus of galvanism, when placed in a solution of strychnine, as well as to account for the fact that in animals poisoned by strychnine the irritability of the voluntary and involuntary muscles, as well as the excitability of the nerves, disappears more quickly than when life is destroyed by other means.

Dr. Brown Séquard thinks that the action of strychnine "consists in an increase of nutrition of the nervous centres, by which excess of nutrition the reflex faculty becomes much increased." The deeper I go into the subject the farther I differ from this view, and the more am I inclined to believe that strychnine acts by destroying the power of the tissues and fluids of the body to absorb oxygen and exhale carbonic acid; in a word, from thus arresting nutrition by preventing the interchange of the gases in the animal economy.

[Dr. Harley asserts that, to produce convulsions, the poison must be first absorbed and conveyed to the spinal cord by the blood-vessels. This is a view directly opposed to the opinion held by almost all the great physiologists of the present day. Stilling, Valentin, Budge, Volkmann, Arnold, Ludwig, &c., appear to take for granted the doctrine of the direct action of strychnine on the spinal cord, and in corroboration of this view, they cite numerous experiments upon frogs, where the animals were thrown into violent convulsions by the application of the poison to the cord even when the heart had been excised, but they have perhaps erred in not rather imputing the action of the poison to its having been absorbed by the capillaries of the cord and vertebral canal, and being thus conveyed with the blood to the nervous substance. Dr. Harley says—]

The following experiments will, I think, prove the justness of the latter supposition :—

When, instead of dropping the solution of strychnine upon the frog's spinal marrow as it lay in the vertebral canal, I first carefully isolated upon a piece of oil-silk about half an inch of the cord, imme-

diately below the brachial enlargement, and separated throughout a short extent its lateral halves, in order to form a sort of cup for the better reception of the poison, I found that a concentrated solution of the acetate of strychnine might be retained in the hollow of the cord, even when the heart had been left untouched, without any symptoms of tetanus supervening. The animals so treated usually survived the operation for two hours, and remained free from all symptoms of poisoning, unless some of the strychnine accidentally found its way along the side of the cord into the vertebral canal. From this I inferred that strychnine does not act directly upon the spinal cord. There being still, however, a possibility that the poison might have a direct action upon the upper portion of the spinal marrow, even although it failed in producing an effect upon the lower, where, instead of being in contact with the true nervous substance of the spinal cord, it might have only reached the roots of the sacral nerves, whose origins are very high up (in which case the non-appearance of poisoning might have been due to the previous known fact of strychnine not acting directly upon the nerves), I turned my attention to another reptile, the toad *(Bufo vulgaris.)* In this animal, the cord can be isolated in the upper portion of the dorsal region without the operation inducing immediate death. The experiments upon the toad showed, equally with those made upon the frog *(Rana temporaria)*, that the direct application of the acetate of strychnine to the isolated spinal cord is not followed by tetanic convulsions, or by any other symptom of poisoning.

Convinced by a repetition of these experiments that the non-appearance of tetanus was not due to any error in manipulation, I turned from cold to warm-blooded animals, in order to ascertain if the spinal marrow was here equally insensible to the direct application of strychnine. The result of the first attempt was fortunately so decisive, that it did not appear necessary to make any further experiments. It was as follows :—

The vertebral canal of a young cat (a third grown) was opened in the dorsal region between the eighth and thirteenth vertebræ, and the cord carefully isolated upon oil-silk to the extent of an inch. The dura mater and arachnoid membrane were then gently removed, and, lastly, the vascular pia mater delicately detached from around the cord throughout half an inch. Having thus rendered the experiment as far as possible independent of the interference of the blood-vessels, the lateral columns of the cord were separated longitudinally, and into the little cavity thus formed was introduced a super-saturated solution of the acetate of strychnine. No symptoms of tetanus presenting themselves at the end of ten minutes, the cavity was slightly enlarged, and more of the solution added. A renewed interval of five minutes having elapsed, and there being still no symptoms of convulsions, the cavity in the cord was sponged out, and refilled with a fresh portion of strychnine. After waiting seven minutes longer (twenty-two

minutes in all) without the slightest manifestation of poisoning, I felt perfectly satisfied that strychnine, when directly applied to the nerve-substance of the spinal marrow, does not possess the power imputed to it of producing tetanus. But still further to satisfy myself that the nonappearance of convulsions was not due to any lack of poisonous qualities in the solution employed, I dissected the skin from one of the femoral veins, and brought a third of the quantity of the solution which was applied to the cord into contact with the external surface of the blood-vessel. In one minute and three-quarters the animal became violently tetanus *throughout the whole body*. The cord was divided at the exposed part without the tetanus disappearing from the lower extremities. This shows that the effect of the poison is not limited to any particular part of the spinal marrow.

A more conclusive result than the above can scarcely, I think, be desired, to prove the inability of strychnine to cause tetanus by a direct action upon the spinal cord. Had the membranes of the cord and their vessels not been removed before the application of the poison, tetanus would most probably have supervened, just as happened in the experiments upon the frogs, when the cord was not carefully isolated. The occasional occurrence of tetanus in frogs after excision of the heart is easily accounted for, on the supposition that the poison, when applied to the cord, finds its way into the neighbouring capillaries, before their circulation has entirely ceased, and is conveyed with the blood to the nerve substance. This supposition is warranted, on the ground that the circulation in the web of the frog's foot is distinctly visible for some time after excision of the heart, and strengthened by the absence of any data disproving the probability of the circulation in other parts of the body being to a similar degree independent of the cardiac impulse. The occasional negative results in the one case cannot therefore be looked upon as lessening the value of the positive effects in the other, although the latter experiments are by far the less numerous. The following is another experiment, which not only confirms the foregoing, but shows the progressive advance of the effects of strychnine upon the cord, while at the same time it illustrates in a striking manner the independent action of different parts of the spinal nerve centres.

The vertebral canal of a snake (*Coluber natrix*), three feet long, was opened at the union of the upper and middle third; the cord was next isolated on oil-silk, and an inch of the pia mater, with its vessels, carefully removed. A few drops of the supra-saturated solution of strychnine were kept during thirteen minutes in contact with the exposed nerve substance, without producing the least symptom of tetanus. The oil-silk was then removed, and the cord allowed to slip back into the vertebral canal, and some of the solution of the poison was introduced into an opening made in the thorax. The animal, which had been previously breathing very slowly, began in a short time to respire more rapidly, and in six minutes symptoms of impending

tetanus became apparent. The spasms first became visible in the muscles about the neck, and very gradually descended along the vertebral column, till, in about two minutes they had reached the tail. This gradual progress of tetanus is beautifully apparent in a long-bodied animal like a snake, and the distinctness of the advance is also better marked, probably on account of the slow circulation of the blood. The spinal cord was afterwards divided at the exposed part, and the tetanus in the upper part was seen to be independent of that in the lower, and *vice versâ*. The mutual independence of the different portions of the cord was not so striking until after the animal had become somewhat exhausted. When the intervals between the spasms became considerable, it was interesting to see how irritation applied to the tail caused gradual tetanus up to the point of section, but not beyond it. When, on the other hand, irritation was applied to the head, the tetanus gradually travelled as far down as the point of section, and for about two inches beyond, in the muscles, doubtless, which received their nerves from the lower part of the upper portion of the cord. At first, the tetanic movement in these muscles was sufficiently strong to excite spasm in the lower portion of the body; but afterwards, as the animal became more exhausted, and the spasms less violent, while the stimulus required to call them into play was greater, the tetanus could not be communicated from the muscles in the lower to the upper, nor from the upper to the lower, portion of the vertebral column. This clearly proves that the indirect action of strychnine is not limited to one particular part of the cord.

It appears strange that the poison, when directly applied to the spinal cord, did not affect the nerve substance, through entering it, either by imbibition or deosmose. Can it be possible that poisons deosmotically absorbed are not assimilated by the nervous system? or do they first require to undergo a change in the blood before they can act? That strychnine should produce convulsions when carried to the spinal cord by the blood-vessels, and not when directly applied, is certainly very remarkable. The solvent in each case is the same, the liquid part of the blood being nothing more or less than water, and the blood-vessels cannot bring the poison into more intimate connexion with the nerve-tubes than the hand can; for the ultimate capillaries do not enter the nerve-tubes, but only ramify on their exterior. If, therefore, the poison really acts upon the contents of the nerve-tubes, it must, to reach their interior, first pass by deosmose through the external sheath; and deosmose being a purely physical process, it matters not how, or by what means, the substance is brought into contact with the membranous tube of the nerve; for once there, its after-progress is in all cases identical. Now, as we have brought strychnine into the most favourable circumstances for the development of its action upon nerve substance, and no result has followed, we are forced to conclude that strychnine has *no direct* chemical or physical action on nerve matter. Seeing that the poison acts when conveyed by the blood-

vessels, we must try and discover whether or not it is transformed in the blood into a more active poison, or if, though not itself transformed, it yet possesses the power of so modifying the organic constituents of the blood, as to render them not only useless for the purpose of nutrition, but even pernicious. Chemistry has as yet failed to reveal whether or not strychnine is decomposed and transformed in the blood into another substance more baneful than itself; but it has shown, that the poison possesses the property of so modifying the organic constituents of the blood as to render them incapable of absorbing oxygen, and exhaling carbonic acid, and thus becoming fitted for the purpose of nutrition. It is well known, that "the continual afflux of scarlet blood is a condition very important to the normal molecular constitution of the nervous centres. This proposition especially holds good with mammals and birds; but it is less strictly applicable to reptiles and fishes, in whom the interchange of the gases is less active." When the oxidized materials required as nourishment by the nervous system are either deficient in quantity, or impaired in quality, disordered function of the nerves is the immediate result. We have a most striking example of the former condition in cases of hemorrhage, where an insufficient supply of the oxidized substances is not unfrequently followed by convulsions; the latter is exemplified in cases where oxygen is prevented from entering the blood, and consequently the organic substances fail to become oxidized and fitted for their peculiar office. Lastly, the same thing occurs when even both the oxygen and the organic substances are present, but where the oxidizing process is either partially or totally arrested by the presence of a foreign substance possessing the property of hindering the constituents of the blood from combining with oxygen. Derangement in the function performed by the molecules of the nervous system occurs just as surely in the latter example as when either the oxygen alone, as in the second instance, or both the oxygen and the oxidizable materials, as in the first case, are wanting. Strychnine, I believe, from the results of the cited experiments, acts in the third of the three ways—that is to say, it has no *immediate* effect upon the nervous system, but acts indirectly through the power it possesses over the functions of the organic constituents of the blood. Many other poisons, I doubt not, exert their influence in a similar manner; for I have found, that hydrocyanic acid, chloroform, nicotine, alcohol, ether, morphine, and several other narcotics, have the same power of destroying the property possessed by the organic constituents of the blood of absorbing oxygen and exhaling carbonic acid.

A more particular study of the effects of different substances on the blood may yet not only furnish a clue to the actions of poisons in particular, but afford a direct explanation of the physiological action of remedies in general; and the more speedily our knowledge in that direction advances, the more rapidly will medicine be raised to its proper position amongst the inductive sciences.—*Lancet, June* 14 *and July* 12, 1856, *pp.* 647, 40.

155.—NEW METHODS OF DETECTING STRYCHNIA AND BRUCIA.

By JOHN HORSLEY, Esq., Cheltenham. (Read at the Meeting of the British Association for the Advancement of Science.)

In the first lecture Mr. Horsley observed that the circumstances attending Palmer's trial induced him to make a series of experiments on the subject, and he tried the effects of a precipitant formed of one part of bichromate of potash, dissolved in fourteen parts of water, to which was afterwards added two parts in bulk of strong sulphuric acid. This being tried upon a solution of strychnia, the bulk was entirely precipitated in the form of a beautiful golden coloured and insoluble chromate. The experiment, as performed by Mr. Horsley, was very interesting, and scarcely a trace of bitterness was left in the filtered liquor. He did not claim to have originated this discovery of the use of a chromic salt and an acid liquor; but the point to which he called attention was the essential difference in the mode of application, and he maintained that it was as much out of the power of any human being to define the limit of sensibility which he had attained, as it would be to count the sands or to measure the drops of the ocean. Taking thirty drops of a solution of strychnia containing half a grain, he diluted it with four drachms of water. He then dropped in six drops of a solution of bichromate of potash, when crystals immediately formed, and decomposition was complete, splitting up the half grain of strychnia into millions of atoms of minute crystals; he said that each of these atoms, if they could be separated, would as effectually demonstrate the chemical characteristics of strychnia as though he had operated with a pound weight of the same. He then showed the chemical reaction with those crystals. Dropping a drop of liquor containing the chromate of strychnia into an evaporating dish and shaking it together, he added a drop or two of strong sulphuric acid, and showed the effect as previously noted. He next showed the discoloration produced in chromate of strychnia and chromate of brucia by sulphuric acid, the former being changed to a deep purple and then to a violet and red. It had been asserted, since the trial of Palmer, that the non-detection of strychnia in the body of John Parsons Cook was owing to the antimony taken by the deceased having somewhat interfered with the tests. Such a supposition was, in his (Mr. Horsley's) opinion, absurd. Nothing, he considered, could more incontestably disprove the fallacy than either of the two new tests which he then performed. These he considered double tests, because they had first the obtainment of a peculiar crystalline compound of strychnia, which was afterwards made to develope the characteristic effects by which strychnia is recognised.

[Mr. Horsley, in continuation, said:]

Wishing to make some experiments on animals, I purchased (for I could obtain no other) three fine white rats, and invited my friend

Dr. Wright to be present. At 7.20 p.m. we gave a quarter of a grain of powdered strychnia by way of the mouth, projecting it from paper, and washing it down with a little water.

In about twelve minutes the first signs of involuntary twitchings of the muscles were observed but they were of a slight character, and continued occasionally during long intervals. After an hour had elapsed, finding the strychnia had not produced much effect. it was suggested by Dr. Wright that the largest rat (which was a female) should have another dose of a quarter of a grain, which was administered. This also not producing any marked effect, at half-past nine o'clock a half-grain more was given to the same animal, leaving the others to see what effect the quarter of a grain would have on them in course of time.

At eleven o'clock I retired to rest, after placing a saucer of bread and milk in the box with the rats. At a quarter to 4 a.m. I got up, for the purpose of seeing how the rats were, and found them still alive and apparently healthy, having partaken plentifully of bread and milk.

At 7 a.m., when the assistant came down, he found two of the rats (one that had a quarter of a grain and the other which had one grain) had recently died, as their bodies were quite warm, and, in about twenty minutes afterwards, the remaining rat died. This animal had lived just twelve hours after having had a quarter of a grain of strychnia administered.

In about three hours afterwards I proceeded to open the rat which had died last, and examined every part of the body with a view to detect the poison, commencing with the heart; but in no instance could the poison be found.

I will now state the mode of procedure I adopted, in order that you may judge whether or not the treatment was proper.

The different organs were triturated in a mortar with water, to which alcohol and acetic acid were afterwards added, the whole allowed to digest for a while, and then boiled. After being strained and filtered, the liquor was evaporated to dryness by a water-bath—the extract re-dissolved with alcohol and acetic acid, and filtered. This liquor was again evaporated, and similarly treated with fresh alcohol, &c. Lastly, the extract was dissolved in water, and the acid carefully neutralized with caustic potash; the resulting precipitate, did not, however, on being treated with sulphuric acid and bichromate of potash, afford the least indication of strychnia; but in order to show that it could not have been present, or, if present, that the organic matter did not interfere or prevent any reaction, I purposely introduced a little strychnia, which instantly developed the usual purple and violet colours. This testing and counter-testing proved unquestionably the absence of strychnia in the precipitate. There was, moreover, a total absence of bitterness in all the liquors.

In this way I proceeded, step by step, with every part of the bodies, but could not get any reaction by the tests I used to detect the poison.

What, then, became of the strychnia? Has it been decomposed in the organism and its nature changed, as Baron Liebig intimates when writing in general on the alkaloids?

Now, in reference to the non-detection of strychnia, I do not positively assert that such is the case, but I think it not improbable that the strychnia may have become imbibed into the albumen or other solid animal matter, and so abstracted from the fluid, forming by coagulation (say, for instance in the blood) a more or less insoluble albuminate. The idea has occurred to me, from noticing the coagulation of the glairy white of egg with strychnia, and the fact of my not recovering the full quantity of the alkaloid whenever I had introduced it. At any rate it merits consideration.

Experiment 2.—At three o'clock in the afternoon, I administered to a wild rat at least three-quarters of a grain of strychnia in a fluid state. It apparently evinced but very little of the effects of the poison, and, after being kept alive for five days, was only purposely killed by a dog, partly because of the cage being required by the person who lent it to me, and partly from the fact of the animal, which in other respects was very well, having œdematous swellings of the palms of the feet, and one of its fore-feet contracted.

Experiment 3.—I administered two grains of strychnia in the form of a pill, made with conserve of roses, to a full-sized terrier, taking the precaution against its rejection, on account of its bitter taste, to wrap it up in a fold of blotting paper. The dog was dosed at 6 p.m., and taken out into the outer laboratory to die. I visited him regularly every half-hour for five hours, until I went to bed, and the dog, as far as I could observe, had not evinced a single symptom. In the morning, however, it was dead, but lying apparently in the most natural position for a dog asleep, with its head resting on its shoulder, and its feet stretched out. When taken up, blood flowed freely from its mouth. On opening the animal, I found the right ventricle of the heart empty of blood, while the left was full, some of the blood being liquid and some clotted. The stomach was carefully secured at both its orifices and detached. On making an incision I was surprised at not seeing the paper in which I had wrapped the pill, naturally expecting it would have been reduced to a pulp by the fluids of the stomach. I therefore sought for it, and lo! here it is, in precisely the same condition as when first introduced into the gullet of the dog, and containing nearly all the strychnia. I have been afraid to disturb it until I had exhibited it to you; and now I will weigh the contents, and ascertain how much has been absorbed or dissolved out, or treat it in whatever way you like. This experiment is important, as showing the small quantity of strychnia necessary to destroy life, and had I not been thus particular to search for the paper envelope, it might possibly have led to a fallacy, as I must have used an acid, and that would have dissolved out the strychnia, and the inference would have been that it was obtained from the contents of the stomach, whereas it had never been

diffused. [I have since ascertained that it took three-quarters of a grain to kill the dog.]

In this case, also, none of the absorbed strychnia was detectable in the blood, or any part of the animal, although the greatest care was observed in making the experiments. In some cases the precipitates were digested in ether, at other times in chloroform but without yielding any indications of strychnia. Slight traces were, however, observable in the contents of the stomach.

P.S.—Since writing the foregoing I have made some experiments which I think will prove that it is highly probable a more or less insoluble compound of organic or animal matter with strychnia is formed.

For instance, I took the contents of an egg (the white and the yelk), agitated them with a solution of strychnia containing one and a-half grains of strychnia, and boiled them to complete coagulation in a water-bath. I next broke up the coagulum, and tried to extract the strychnia by boiling it with water. The filtered liquor, which was slightly bitter, was evaporated to dryness, boiled with alcohol and a few drops of acetic acid, and again evaporated to dryness. This extract was treated with water, acidulated with acetic acid, filtered, and carefully neutralized with liquor potassæ; on standing for a short time, small needle-shaped crystals of strychnia were deposited, but in small proportion, perhaps not more than one-sixth of the original quantity used. I next digested the solid residue of the egg in strong sulphuric acid, diluted it with water, and then boiled the mixture; the liquor, though strongly acid, left no bitterness on the palate. After filtration, and pressing the residue in a cloth, the liquor was concentrated by evaporation, and neutralized with ammonia, but only a precipitate of organic matter was obtained, for when this was collected in a phial and washed with ether, hardly a trace of strychnia could be detected on treating that which remained after evaporating the ether. This, I think, proves that the strychnia must either have been destroyed by combination with the solid organic matter, so as to render it incapable of being extracted as pure strychnia, or else decomposed by the sulphuric acid in the attempt to extract it from the albuminoid matter.—*Med. Times and Gazette, Aug.* 23 *and Sept.* 6, 1856, *pp.* 198, 244.

156.—MODE OF DEATH IN POISONING BY STRYCHNIA.

By John Bayldon, Esq., Edinburgh.

The mode in which strychnia occasions death in animals is not uniform, and appears to vary according to circumstances, such as the quantity of the dose and the manner of administration.

1. In some cases, where a very large dose is given, and in a state to act quickly and powerfully, as in solution, the animal may die in a minute and a half, and after death the heart continue contracting. Here the death cannot be by syncope, as the heart is pulsating; nor by asphyxia, as the period of time is too short for that mode of death. In

these cases the mode of death appears to be by a powerful impression on the nervous system. So early as 1822, M. Segalas (Magendie, 'Journal de Physiologie,' ii. 361) concluded that this was the mode of death by large doses of nux vomica. He found, for example, that artificial respiration failed to maintain life when nux vomica was administered in a large dose. He does not mention the state of the heart in his experiments.

2. In most cases the heart can be felt beating after cessation of the respiration, and death; and on opening the thorax it is found pulsating. Here death has evidently been by asphyxia: not necessarily asphyxia caused by the rigidity of the muscles of respiration during the convulsions, for probably asphyxia may be caused by the loss of irritability in the muscles of respiration, and may occur when the animal is in the relaxed condition, in the interval between the paroxysms.

3. In some cases (those formerly mentioned), the heart is found motionless after death, and as before said, the mode of death here may be syncope conjointly with asphyxia. Syncope, however, may possibly be the principal cause of death in some cases.

Where the convulsions have been severe and long-continued, death has been supposed to take place by exhaustion. It may, perhaps, be so; still, however, the exhaustion will cause death in one of the above modes.

The results arrived at are as follows:

1. That strychnia has an action on the heart, lessening its irritability, and that this action is probably direct.

2. That the mode of death by strychnia is not uniform; it may take place by a general impression on the nervous system—by asphyxia, and possibly by syncope, or syncope conjoined with asphyxia.

The conclusions drawn require to be confirmed, the conditions under which the various phenomena are manifested to be exactly ascertained, and a general theory of the mode of action of strychnia to be established, explaining the whole.—*Lancet*, *July* 19, 1856, *p.* 72.

157.—THE MEDICO-LEGAL CHEMISTRY OF STRYCHNIA.

By Dr. Henry Letheby, Professor of Chemistry and Toxicology, and Officer of Health to the City of London.

[A warm discussion has lately been maintained in our journals, respecting the discovery of strychnia in the bodies of those who have been poisoned by it. A few toxicologists have very positively stated that it is impossible for the art of chemistry to identify it in those cases where death has been the result of a minimum dose. Others have asserted that there are no instances in which strychnia cannot be detected in the body, after the administration of a fatal dose; no matter how it was given, or how long after death it was searched for. The object of this paper is to remove the doubts which may arise from either view of the question, and to show that the use of strychnia cannot be resorted to for criminal purposes without the certainty of detection.]

In discussing the chemistry of strychnia it will be convenient to divide the subject into two parts—namely,

Part 1. On the properties of strychnia when in a pure state; and

Part 2. On the means of extracting the alkaloid from organic mixtures.

I.—*The Properties of Strychnia.* Strychnia occurs either in the form of a white powder or in crystalline particles of different magnitudes and appearance. Sometimes the crystals are in little pearly scales, like mica, and at other times they have the form of octahedra, with a rhombic base, though they are more generally obtained in somewhat large prisms, of a four-sided figure. When the alcoholic or ethereal solutions of strychnia are allowed to evaporate spontaneously on a slip of glass, the crystalline forms are very characteristic. The alkaloid is without odour, but its taste is remarkably bitter—so much so, that one grain of strychnia will give a very perceptible bitterness to 1 gallon, or 70,000 grains, of water; and a single drop of a solution containing one part of the alkaloid in 7,000 of water is distinctly bitter to the taste. The salts of strychnia are not so bitter as the alkaloid itself.

The solubility of strychnia in water is not very great, for there are required about 7000 grains of cold water, or 2500 of boiling water, to dissolve one grain of the alkaloid. Its solubility in alcohol, ether, Dutch oil, bisulphuret of carbon, benzole, and chloroform, is much greater; for example, one part of strychnia will dissolve in about 1000 parts of bisulphuret of carbon, in 350 of ether, in 250 of benzole, in 100 of alcohol, in 30 of Dutch oil, or in 10 of chloroform. The last-named liquid is therefore its most powerful solvent.

Of all the common salts of strychnia, the acetate is by far the most soluble both in water and in alcohol, though it is not dissolved to any great extent in ether; and when a drop of the solution of any salt of strychnia is allowed to evaporate spontaneously from a slip of glass, the crystalline forms which remain are easily identified under the microscope; for they appear as plumose tufts of acicular crystals radiating from a centre, or as long flat needles, or as thin rectangular plates.

A solution of the alkaloid in dilute acetic acid is freely precipitated by each of the following agents—namely, bichloride of mercury, chloride of platinum, chloride of gold, chloride of iron, carbazotic acid, perchloric acid, iodine, iodide of potassium, tincture of gall or tannic acid, ammonia, potash, soda, and their carbonates.

Many of these reactions are particularly delicate; and when the precipitates are examined under the microscope, they show a series of crystalline forms that are very characteristic of the poison. The delicacy of some of these tests is such, that with a few drops of the acetic solution, containing only one part of the alkaloid in 2000 of the solvent, a distinct reaction is witnessed. This is the case with the iodide of potassium, the chloride of gold, and the carbazotic acid tests. Again, if the one-thousandth part of a grain of strychnia be placed on a slip of glass, then dissolved in a small drop of acetic acid, and finally touched with a little of the re-agent previously dissolved in water, the characteristic tints and crystalline forms will instantly be developed.

In this way iodide of potassium will produce a rich amber-yellow or reddish-brown precipitate, composed of minute prisms, grouped in rosettes and in macles. Carbazotic acid will occasion a pale yellow precipitate of very delicate needles, arranged in tufts and in radii; or else as feathery crystals much serrated at the edges. Chloride of platinum and chloride of gold will produce pale yellow crystals, which first appear as small nodules made up of myriads of minute particles; these soon give place to short prisms arranged in circular groups, or to long needle-like prisms radiating from a centre; here and there the prisms are so large as to look like thin rectangular tables. Bichloride of mercury occasions a white precipitate, which is composed of plumose tufts and acicular radiating crystals.

When an alcoholic solution of iodine is added to the acetic solution of strychnia, the crystalline forms are somewhat different from those which are produced by iodide of potassium; for there are seen minute circular crystals grouped in tufts and in radii; myriads of microscopic dots, of a somewhat triangular form; larger, but very thin triangular plates, arranged in a leaf-like shape, or else in the form of rosettes; and, lastly, a number of macled prisms, like those which are produced by the iodide of potassium, but of a much larger size.

The mineral acids do not exhibit any reaction with pure strychnia; but if a trace of brucia be present, the alkaloid is stained of a brilliant red colour by nitric acid. The resisting power of strychnia to the action of acids is very great, for oil of vitriol, or muriatic acid, may be kept in contact with it for months, perhaps for years, without affecting it. We thus have a means of decomposing foreign substances, and of extracting the strychnia from them unchanged.

When strychnia is brought under the influence of nascent oxygen, it instantly acquires a deep, rich blue colour, which speedily passes into purple, violet, crimson, orange, and yellow. This, in fact, is the rationale of the action of all the colour-tests which have within the last ten years been proposed as the means of discovering strychnia.

In 1845, Marchand first made known the fact, that when strychnia was mixed with the puce-coloured oxide of lead, (the peroxide,) and then touched with a drop of sulphuric acid, containing a small quantity of nitric acid, the brilliant colours to which I have alluded appeared. Since that time other re-agents have been proposed in the place of the plumbic oxide: as, for example, Otto, in 1846, suggested the use of bichromate of potash; Mack, in 1846, proposed the peroxide of manganese; and Brieger, in 1850, refined on the process of Otto by recommending the use of chromic acid. The truth, however, is, that anything which gives out oxygen when mixed with oil of vitriol has the power of striking the characteristic tints with strychnia; hence it is that iodic acid, iodate of potash, peroxide of barium, red prussiate of potash, and even the positive pole of a galvanic battery, will develope the tints alluded to.

In performing these experiments, however, there is a right and a

wrong way of using the tests ; it has therefore happened to those who are unacquainted with the chemical principles upon which the action of the tests depends, not only to fail in obtaining the proper results, but to have thought that the fallacies connected with them were insuperable. This has led to the mischievous statements which have lately appeared in the public papers and elsewhere as to the real value of the colour-tests. It is right, therefore, that we should be acquainted with the proper mode of proceeding, in order to ensure the right results, and it is as follows :—First place the strychnia which is to be the subject of experiment upon a clean white plate, then touch it with a small drop of concentrated sulphuric acid ; stir it about with a glass rod so as to mix the strychnia very perfectly with the acid ; allow it to remain in this state for a few minutes, and, if the strychnia be pure, there will be no discoloration. Then cautiously add the re-agent—namely, the peroxide of lead, the bichromate of potash, or the peroxide of manganese—taking care not to add too much of it ; in fact, it is best done by dropping the powder into the oil of vitriol and strychnia from the point of a pen-knife. Lastly, either incline the plate so that acid may gently flow over the powder, or else with great caution stir the powder about with the point of a glass rod. In this way the colour is always sure to be brought out ; and, as far as I know, it is not to be confounded with the reaction of any other substance. Indeed, the only thing which approaches it in appearance is the dirty-violet colour which is occasioned by morphia and its salts when they are treated in the same way. As to the so-called fallacies to the test—namely, salacine, bile, sugar, pyroxanthine, piperine, resinous matters, and many other things, it must be manifest that they are not fallacies when the test is properly performed, for all these compounds acquire their colour directly the sulphuric acid is added to them, and before the other re-agents are applied.

Of all the substances which have been proposed for thus developing the tints with strychnia, bichromate of potash is assuredly the worst : for—

1st. It is itself coloured by the acid, and may thus complicate the result.

2nd. It will not act when organic matter is present, as for example, the vegetable acids, citric and tartaric, cream of tartar, tartar emetic, potassio-tartrate of soda, the residue of an effervescing draught, sugar, gum, and even a little morphia.

3rd. It will not act when nitre, nitric acid, or common salt are present with the strychnia.

4th. It is of all the tests the least delicate ; for while the peroxide of manganese, or the peroxide of lead, will discover the presence of the 1-20000th of a grain of strychnia, the bichromate will not act well with less than the 1-2000th of a grain.

It is true, that by means of the process which I shall hereafter detail for extracting the alkaloid, none of those impurities will be present; yet, in making a comparison of the respective merits of the several

tests, it is right to know that the bichromate of potash reaction is the least satisfactory.

The mode of applying the galvanic test is as follows :—Place a drop of a solution of strychnia (say one part in 10 or 20,000 of water) into a slight cup-shaped depression made in a piece of platinum foil. Allow the fluid to evaporate, and when dry, moisten the spot with a little concentrated sulphuric acid. Connect the foil with the positive pole of a single cell of Grove's or Smee's battery, and then touch the acid with the platinum terminal of the negative pole. In an instant the violet colour will flash out, and on removing the pole from the acid, the tint will remain.

The last test for the recognition of strychnia is its physiological action on a small animal; and, as Dr. Marshall Hall has shown, the frog is the best subject for this kind of investigation. The 1-1000th of a grain of the alkaloid dissolved by the aid of a little acetic acid in a drop or two of water, and injected into the abdominal cavity of the animal. will speedily produce the tetanic effects which are so characteristic of the poison ; and the same quantity dropped into its mouth will also act after the lapse of half an hour or more.

In conclusion, it ought to be stated that the endurance of strychnia, under the influence of decomposing agencies, is remarkably great; for not only does it resist the action of concentrated oil of vitriol, but it also remains untouched in the presence of the most active fermentation, and even of the prolonged putrefaction of organic matters. I have had it in contact with such substances for many weeks, without its manifesting any sign of change.

II—.*The extraction of Strychnia from organic mixtures.*—[The process which is generally followed is that given in the last edition of Orfila. The organic mixture is filtered and evaporated nearly to dryness; the residue is then treated with alcohol, and again filtered and evaporated until it acquires the consistence of a soft extract; this is super-saturated with a solution of ammonia, and the dirty brown precipitate so obtained is the alkaloid to which the operator applies his tests.]

The process that I am about to describe is so certain and delicate in its results, that it has never failed me in my search for strychnia when death has been caused thereby, or when the poison has been purposely mixed with blood, urine, soup, beer, and many kinds of putrifying organic matters.

In operating on the contents of the stomach, or on such fluids as soup and porridge, it is proper to acidify them with a little acetic acid, and, if necessary, to dilute with water, so that they may filter easily through a linen cloth. Stas prefers an organic acid, as tartaric or oxalic; Mr. Rodgers gives the preference to muriatic acid; and others have a fancy for sulphuric. But this is a matter of minor importance, unless the operator has a design in view, as, for example, the discovery of some other poison. I give the preference to acetic acid, first,

because the acetate of strychnia is a very soluble salt; secondly, because the acid has the power of coagulating casein and other albuminous matters; thirdly, because the excess of it is easily got rid of; fourthly, because it has no disposition to change the starchy compounds into sugar; and, above all, because it cannot complicate the inquiry in those cases where other poisons may be present.

The aqueous solution, after having been filtered through cloth, is to be evaporated on a water-bath to the consistence of a thin paste. This is to be treated with eight or ten times its bulk of cold alcohol, then filtered and distilled, so that the spirit may not be lost. The residue, after the evaporation of all the spirit, is to be diluted with water, filtered again, if necessary, and super-saturated with liquor potassæ. This is to be shaken up with its own bulk of ether, and allowed to stand until the aqueous and etherial solutions have separated from each other. If there be any difficulty in this on account of the vesicular state of the ether, the vesicles may be broken down by a glass rod, or by the addition of a little more ether, or by the pouring in of a few drops of water. The clear and generally colourless etherial solution is to be decanted, or separated in any other manner, and the aqueous residue treated with a fresh quantity of ether; and so a third time if necessary. Mr. Herapath and Mr. Rodgers prefer chloroform as the solvent, but in my hands there is some difficulty in getting the chloroform to separate freely, especially when the density of the solution is somewhat great, and when there is a precipitate in it from the action of the potash; otherwise there can be no doubt that chloroform is the best solvent, especially when the solution contains a large amount of strychnia; but this is not often the case.

The etherial solution is to be distilled, so as to recover the ether, and the residue dissolved out of the retort with a small quantity of diluted acetic acid: if the solution be turbid, it is to be filtered, in order that the particles of fatty matter contained in it may be separated; and then by a second treatment of potash and ether, the alkaloid, after the spontaneous evaporation of the ether, is generally sufficiently pure to be identified. If, however, the contents of the stomach, or the matters operated on, contained pepper or other such spice, the residue will contain piperine, and this will interfere very seriously with the colour-tests. It is, therefore, to be treated with a few drops of concentrated sulphuric acid, and set aside in a warm place for two or three hours; during which time the acid will have charred the organic substance, but will not have injured the strychnia; and then, by dilution with water, saturation with potash, and a third treatment with ether, the alkaloid will be obtained pure and in white crystals. In this state it may be easily identified by all the tests which I have already described.

It will be manifest to those who are conversant with toxicological pursuits, that a little variation in the above process will serve for the detection of the other poisons: for example, the distillation of the

first-formed acid liquid will yield the volatile poisons, as alcohol, prussic acid, and the volatile oils. Sulphuretted hydrogen will betray the presence of arsenic, sugar of lead, corrosive sublimate, or any of the metallic chlorides that may be present in the alcoholic solution; and the subsequent treatment of the filtered aqueous portion with a little sugar of lead will precipitate sulphuric acid, phosphoric, oxalic, and others of the vegetable kingdom; while the subsequent addition of a slight excess of sulphuric acid to the filtered liquid will remove any excess of lead; and then, while the ether will take up most of the organic alkaloids, as strychnia, brucia, veratria, nicotina, conia, emetina, aconitina, atropina, colchicina, quinia, cantharidin, and some others, it will not touch morphia or cinchonia, both of which may be recovered from the alkaline residue.

The process for obtaining strychnia from urine is still more simple. When the urine is set aside in a warm place for a few days, it speedily decomposes and becomes alkaline. If it be filtered while in this state, and then shaken up with a small quantity of chloroform, the alkaloid will be readily extracted, and it may be purified in the way mentioned.

When blood is the subject of examination, it must be diluted with about its own bulk of water, then acidulated with acetic acid, and boiled for several minutes. The liquid must now be filtered and evaporated nearly to dryness; the residue treated with spirits of wine, and managed in the same way as the contents of the stomach. I do not find Bernard's process for the decoloration of the blood, by means of sulphate of soda, to be a certain one; for although it is admirably well suited for the removal of all colouring matter, yet the temperature which is necessary to evaporate the saturated saline solution is likely to decompose the strychnia, and this, I think, is the cause of its uncertainty.

In order to extract strychnia from the tissues of the body it is necessary that they should be broken up into a pulpy mass, and digested for some hours in water acidulated with acetic acid. The solution may then be raised to a boiling temperature, and, when cold, squeezed through a linen cloth; after which it is to be evaporated over a water-bath, and treated in the same manner as the aqueous residue from the contents of the stomach.

I have not had an opportunity of testing the more solid parts of the animal frame for this poison; but it would appear from the investigation of Mr. Rodgers and Mr. Girdwood, that strychnia may be extracted even from the bones of animals poisoned by it. Their process, as given in *The Times* newspaper of the 30th ult., is as follows:

"The bones, broken into pieces of a convenient size, are placed in a deep evaporating basin, and covered with dilute hydrochloric acid (one part acid and ten parts water), and digested over a warm bath until dissolved: when cold the liquid is filtered: to the filtered liquid sulphuric acid must be added as long as a precipitate is produced; the liquid is again filtered: to the filtrate sulphate of magnesia must be added in the proportion of an ounce to every pound of bones origini-

nally taken. Excess of ammonia is now added, and the liquid again filtered; this liquid must now be agitated with about half an ounce of chloroform in a stoppered bottle, which, as before stated, separates the strychnine; after subsidence the chloroform is to be drawn off by a pipette, and agitated in a capacious tube with distilled water; the chloroform must now be drawn off and evaporated to dryness over a water-bath, the residue moistened with concentrated sulphuric acid, and heated over a water-bath half an hour, diluted with distilled water, and filtered into a tube; excess of ammonia added, and again agitated with about three drachms of chloroform. This last operation requires repetition, as the chloroform solution will not yield on evaporation strychnine in a sufficient state of purity for the application of the colour-test. It may be necessary to remark that in the above process advantage is taken of the solubility of strychnine; for as the ammoniacal solution to which the chloroform is first added will generally equal an imperial pint in quantity, nearly one grain and a quarter of strychnine might be in solution notwithstanding the presence of excess of ammonia."—*Lancet, June* 28 *and July* 12, 1856, *pp.* 706, 36.

158.—PROCESS FOR OBTAINING STRYCHNIA FROM THE ORGANS AND TISSUES OF THE BODY.

By J. E. D. Rodgers, Esq., Lecturer at St. George's School of Medicine, and J. P. Girdwood, Esq., Assistant-Surgeon, Grenadier Guards.

[From numerous experiments which have been made, it has been found easy to separate strychnia from the animal tissues, when in a state of decomposition,—in one case, even so long as twelve months after interment. Before applying the colour tests, it is indispensable that the alkaloid be isolated, and every trace of organic matter removed, or the characteristic matters will be interfered with.]

The process is as follows:—Digest the contents of a stomach, together with that organ itself, (cut into small pieces,) with water acidulated with hydrochloric acid, (acetic or sulphuric acids will do, but we give the preference to the hydrochloric,) in a porcelain dish, over a water-bath, for not less than two hours; when cold, strain through muslin, and filter; evaporate to dryness over a water-bath; digest the residue in alcohol, acidulated with a few drops of hydrochloric acid; filter, and evaporate to dryness over a water-bath; treat with distilled water, and when all that is soluble is taken up, (in some cases the whole is dissolved, in others there is a considerable residue,) filter into a long wide tube; then add excess of ammonia, and agitate with about half an ounce of chloroform. When the chloroform has subsided, it must be separated by means of a pipette, and poured into a small evaporating basin, and evaporated to dryness. This residue contains the strychnine, but with so much organic matter that it would be absurd to expect the reactions of the test, except when present in large quantity, until further purified, and to effect this it must then

be moistened with concentrated sulphuric acid, and allowed to remain over the water-bath for at least half an hour; distilled water must then be added, and the solution poured into a test-tube, care being taken to rinse out the dish with hot distilled water; when cold, add excess of ammonia, and agitate with about three drachms of chloroform. This last chloroform solution usually contains the strychnine in a state sufficiently pure to admit of testing; but in some cases it will be found necessary, when the substance is present in extremely minute quantity, to repeat the operation of charring the organic matter with concentrated sulphuric acid, and again separating with chloroform. A small portion of this chloroform is now to be separated by a small pipette, and several drops allowed to evaporate successively on as small a space as possible on a white porcelain capsule. A drop of concentrated sulphuric acid is then added, allowed to remain for half a minute, and a small crystal of bichromate of potash is then placed in it, and after remaining for a few seconds, is drawn across in various directions by means of a fine glass rod. The characteristic violet colour will mark the course of the crystal.

It cannot be too generally known that the substances said wholly to prevent the detection of strychnine can never do so in the hands of a competent analyst: and we would mention that in our experiments they did not oppose the slightest obstacle.

When the liver, spleen, or kidneys are the subject of analysis, it is advantageous to reduce these organs to a state of pulp in a mortar previous to digestion with acidulated water. In the case of the tissues, if recent, they should be cut up as fine as possible, and triturated in a mortar in like manner; if long after interment, this proceeding is unnecessary.

In the above process, it is occasionally found that the particles of chloroform do not readily join together. In this case, placing the tube in hot water will generally effect that object; but in some cases it will be found necessary to dilute largely with water.

From what we have said, it will be seen that, by the process given in evidence by Dr. Taylor at the recent trial at the Old Bailey, the strychnine could not be obtained (except when present in very large quantity in such a state of purity as to exhibit the characteristic reactions, and would utterly fail where the blood, organs, or tissues were the subject of analysis. Consequently, for future security, it must be a matter of regret that some more perfect method was not employed, particularly as the symptoms on the Sunday and Monday night could not be those of strychnine, seeing that there was but one paroxysm, followed by a long intermission on each occasion, and which might with more propriety be attributed to cyanide of potassium or ammonium. We would, in conclusion, state our perfect concurrence in the opinions publicly expressed by Mr. Herapath, Dr. Letheby, and others, that the colour-tests, with proper precautions, are in the highest degree trustworthy.—*Lancet*, June 28, 1856, *p.* 718.

159.—DIFFERENCES BETWEEN THE SYMPTOMS OF TETANUS, HYSTERIA, AND POISONING BY STRYCHNINE

By Dr. Alfred S. Taylor, F.R.S.

Idiopathic Tetanus from Exposure to Cold and Wet.	*Tetanus from Strychnia.*
1. Symptoms have no connection with any liquid or solid swallowed.	1. Some solid or liquid taken within about two hours or less of commencement of symptoms.
2. Symptoms commence slowly, and progress slowly; difficulty of swallowing, stiffness of jaws, of neck; after some time the body, the legs, lastly the arms; hands not commonly affected.	2. Symptoms commence suddenly with great violence. Nearly all the voluntary muscles of the body are simultaneously affected. Arms and hands spasmodically clenched at the same time as body and legs. Jaw not primarily affected, not always fixed. [N.B. Cook was able to swallow and speak within ten minutes of his death. No case of idiopathic tetanus, so far as I can find, has presented this condition, the jaw being generally the first part to become fixed.]
3. Opisthotonos, or body bent back in the form of a bow, resting on head and heels; does not come on until after many hours or days from the attack.	3. Opisthotonos, a very early symptom, in a few minutes commonly.
4. Paroxysms, or fits of spasm, may be severe, and the person may die from exhaustion. Patient commonly recovers after some days or weeks.	4. When symptoms are once clearly established, they progress to death or recovery. They occupy only minutes. In from ten minutes to two hours after commencement, the person dies or recovers, according to the severity of the paroxysms, and strength of his constitution.
5. In idiopathic or traumatic tetanus there is no *intermission* in the symptoms, merely a remission of the paroxysms. The patient is	5. In tetanus from strychnia, if the dose should not be sufficient to prove fatal, the effects pass off; patient recovers; there is a com-

always under the influence of the morbid cause, which remains until he dies or recovers.

plete intermission in the symptoms.

[N.B. This is a remarkable feature in Cook's case; since, on the Tuesday, he had quite recovered from the attack on the Monday night.]

The differences here assigned, show that in the case of Cook the tetanus was produced by something administered, and not by any ordinary cause.

It may be objected to the medical opinion, that Cook died from an attack of *hysteria* simulating tetanus.

DIFFERENCES.

Hysteria.	*Tetanus of Strychnia.*
1. Connected with a peculiar constitution, chiefly seen in females.	1. Not connected with any peculiarity of constitution.
2. Patient subject to previous attacks or fits. The spasms may be tetanic in hysteria, but there are more commonly convulsive motions of the limbs, alternating with stiffness or rigidity, generally a loss of consciousness, and other symptoms of hysteria.	2. Cook had not been subject to such attacks at any period; never had had any kind of fit before this. A healthy active young man in the prime of life, given to out-door pursuits. If occasionally subject to excitement, the effects (if any) would supervene immediately, and not be postponed for several days. There was no cause of hysterical excitement on Monday and Tuesday night.
3. Paroxysm not fatal; patient speedily recovers.	3. He speedily dies in a paroxysm.

No instance so far as I know, is recorded, in which a young and healthy man in the prime of life, has been at once (suddenly) seized with a fit of hysteria, presenting only the features of tetanus from poison in its most severe form, and like it, proving fatal in twenty minutes from the first attack or commencement of symptoms.—*Guy's Hospital Reports*, 1856, *p.* 297.

160.—TABLE OF CASES OF POISONING BY STRYCHNINE.

By Dr. ALFRED S. TAYLOR, F.R.S., Prof. of Chemistry in Guy's Hospital.

No	Authority and Date of Occurrence.	Dose taken and symptoms observed. Period of Death.	Post-mortem Appearances.	Analysis and Results.
1	Case in Hospital practice, 1831, Dr. Booth and Dr. Bardsley. 'Trans. Prov. Assoc.,' 1834, ii, 215, 'Med. Times and Gazette,' July, 1856. A man, aged 46.	*One grain and a half* taken at a dose, after repeated smaller medicinal doses. Stupor and loss of speech; tetanic convulsions of the whole muscular system; opisthotonos so severe, that but for the assistants, patient would have been thrown off the bed; consciousness retained; breathing short, laborious, stertorous; pupils dilated; insensible; slight intermissions of convulsions; tetanic spasms more and more violent; gasping breathing; body rigidly and permanently bent backwards; cold sweats. Death in *two hours* and *three quarters* after having taken the poison.	Seven hours after death. Fingers firmly contracted; muscular system generally rigid; blood on dividing scalp; vessels of dura mater turgid with dark-coloured blood; arachnoid opaque, and thickened. In right corpus striatum, an apoplectic clot; brain softened around; serous effusion in ventricles; other parts of brain healthy; spinal membranes highly vascular; pia mater had a florid redness, and congested with arterial blood; four patches of extravasated blood between this membrane and arachnoid, opposite last dorsal and upper lumbar vertebræ; spinal marrow healthy; chest and abdomen not examined.	No analysis.
2	Case recorded by Dr. Blumhardt, reported in Wibmer's 'Arzneimittellehre,' art. "Strychnia," p. 254, 1839. Also 'Med. Corr. Blatt des Wurtemb. Vereins.,' 1837; and 'Lancet,' Jan. 7, 1838. A young man, æt. 17.	*Forty grains* (2 scrupel reines strychnin) of *pure strychnia* taken in a glass of water. Soon began to feel great anxiety and restlessness. Four grains of tartar emetic given produced but slight vomiting. In *fifteen minutes* after taking the poison, he was stretched on his back, on the bed; countenance anxious; head and body stiff. He wished to turn on his right side, but could not, having no power, except over the upper extremities. Had his	Inspection made twenty hours after death. In spite of great heat of weather, body unusually stiff and rigid; no trace of putrefaction; muscles universally of a brownish-red colour. On opening the spinal canal, two pounds of dark fluid blood of tarry consistency escaped; vessels of the spinal membranes congested; spinal marrow at the upper part soft, at the lower, hard; general congestion of the brain and its membranes, with dark fluid blood;	As so large a dose of strychnine had been taken, an analysis was made of the contents of the stomach, with a view of determining whether it could be chemically demonstrated to be present; *but there was not a trace of strychnia to be found.* The blood collected retained its thick fluid consistency, and did not undergo

		full consciousness, and spoke in a loud tone, in his usual manner, on his condition, occasionally interrupted by a slight stiffness of the jaw, breathing became difficult; pulse small and quick; occasional fits of spasm, involving the jaw and the whole body. With a violent shuddering of all the muscles of his body, became as stiff and rigid as a statue; arms spasmodically bent at the elbows, and drawn over the chest; feet distorted, and soles inclined to each other; retention of consciousness; face and lips livid; eyes protruding, pupils dilated; moaning; intervals of relaxation. Crushed the tube of stomach-pump between his teeth. Death in *one hour and a half* after taking the poison.	cerebellum softer than natural. Viscera of abdomen and thorax deficient in blood, as if this fluid had been forced into the central organs of the nervous system. Lungs healthy, distended with air, and bloodless; heart flabby, and *empty* as well as the great vessels near it, rendering it difficult to collect any for chemical examination. The blood everywhere fluid. The stomach was full of fresh, solid food; no appearance of the poison; mucous membrane about the cardia reddened. The liver contained more blood than the other abdominal viscera. Gall-bladder empty.	putrefaction. It was examined for strychnia, but no trace was found.
3	Case by Mr. Bennett, occurred at Sydney, April, 1838. 'Lancet,' August 31, 1850. A girl, æt. 13.	*One grain and a half of strychnia*, taken in solution on an empty stomach. Symptoms began by twitching, rather more than *an hour after taking the poison;* general tremors: limbs rigid: whole body stiffened and straightened; neck drawn back; eyes protruding; pulse imperceptible; face livid; froth from mouth; violent tetanic convulsions, with opisthotonos; hands clenched; arms bent; legs and body extended. She died in a violent fit, *two hours and a half* after taking the poison.	No inspection.	No Analysis.
4	Dr. Watson, Glasgow, September, 1845, 'Edinburgh Monthly Journal,' Dec., 1845, p. 908. A girl, æt. 12 (case quoted at the trial of W. Palmer).	*Three quarters of a grain of strychnia. Symptoms* came on suddenly in twenty minutes; arms extended and rigid; face flushed; lips livid; jaw not fixed; body curved, opisthotonos, *Death* in three quarters of an hour from commencement of symptoms; altogether a little over an hour.	Forty-four hours after death. Brain and membranes natural; turgescence of velum and choroid; skin of head bled freely; *spinal cord healthy*, membranes rather vascular; lungs congested; muscular fibre of heart stiff; *cavities of heart quite empty;* mucous membrane of stomach pale and natural.	No Analysis.
5	J. C. Evans, November 17, 1845. 'Medical Gazette,' vol. xxxvii, 1846, p. 925. A man, æt. 26.	Dose and symptoms unknown. Found dead. Body and extremities quite stiff; nails imbedded in palms of hands; pupils dilated; eyeballs protruded; dark frothy saliva from mouth; teeth firmly closed. Glass with white powder near.	Thirty-six hours after death. vessels of head turgid; brain and membranes healthy; lungs healthy, but gorged; heart filled with coagulated blood; stomach contained a dark greenish-looking substance like coffee grounds.	Stomach and contents boiled in water; liquid evaporated, very *bitter*, milky looking, but cleared by ammonia. *Sulphuric acid gave a beautiful rose-pink colour.*

No.	Authority and Date of Occurrence.	Dose taken and Symptoms observed. Date of Death.	Post-mortem Appearances.	Analysis and Results.
6	January, 1846. Cormack's 'Monthly Journal,' Feb., 1846, p. 141; 'Medical Gazette,' xxxvii, p. 254, A woman, æt. 35.	*Three grains of strychnia*, taken in powder in tea. A flow of saliva; no complaint of taste. In twenty minutes, convulsions, every limb shaking, short intervals of recovery, in which she uttered exclamations expressive of great pain; the least motion produced another paroxysm; shaking so powerful that it required several persons to hold her. Death *one hour and three quarters* after taking the powder.	No inspection.	No Analysis.
7	Case of a Medical Student, reported by Dr. Theinhardt. Casper's 'Wochenschrift,' February 28, 1846, p. 143.	About 30 *grains of strychnia* taken in spirit; seen in one quarter of an hour afterwards; breathing, pulse and appearance natural. Spasms in the muscles soon commenced, with hurried respiration; twitchings, followed by perfect rigidity of the whole body. An emetic given without effect. In a few minutes, another paroxysm, with violent motions of the whole body, and opisthotonos. A third and fourth paroxysm followed, the patient groaning and screaming. He died in *half an hour*. Had evidently suffered great pain; had been heard to cry out before Dr. Theinhardt's arrival.	Tongue, gums, and lips violet-coloured, as well as the fingers and toes; the hands were clenched, and the toes drawn backwards; the whole body stiff and hard, like a piece of wood, bent somewhat backwards. No inspection.	No Analysis.
8	Dr. Edwards. 'Edinburgh Monthly Journal,' No. 64, April, 1846. p. 230. An adult man.	Dose and symptoms unknown. Body lying on back, in bed, rigid, and stretched out to its full extent; eyeballs prominent; pupils dilated; mouth firmly shut; arms lying over chest; hands firmly clenched; lower extremities particularly rigid, and left foot concave.	Twenty-eight hours after death. Decomposition commenced; partial relaxation of joints. Brain and membranes healthy, but general turgescence of vessels; lungs congested with dark fluid blood; some tubercular disease; heart dilated, but with vessels healthy, contained a quantity of dark fluid	A bottle labelled poison, and containing strychnia, found near the body. Stomach and contents boiled half an hour in vinegar, and filtered; ammonia gave a fine white precipitate; converted to a pale red by nitric acid; sesquichloride of iron a

			blood; spinal marrow not examined; stomach, intestines, and other viscera healthy.	pale green; tincture of galls a adhesive precipitate. From these experiments concluded to be strychnia.
9	Case of Dr. Warner, October 11, 1846. 'British American Journal,' August, 1847. An adult, æt. 39.	*Half a grain of sulphate of strychnia* taken by mistake for sulph. morphia. *Symptoms* began in less than five minutes; constriction of throat; tightness of chest; rigidly of muscles, in attempting to move; first complained of want of air, and requested the windows to be raised; violent tetanic convulsions, opisthotonos, lasted five minutes, succeeded by partial calm; livid countenance; frothy matter from mouth; moans; attempts to vomit. *Death* in from fourteen to twenty minutes; mind clear until the last.*	No report of examination of body.	No analysis.
10	Case of Mrs. S. Smyth. 'Pharm. Journal,' 1848, vol. ii, p. 293. An adult female (case quoted at the trial of W. Palmer).	*Three grains of strychnia*, in liquid, by mistake for salicine. Spasms in from *five to ten minutes*; screaming; legs drawn up; feet turned inwards; body stiff; easy before death; said "turn me over," died tranquilly; consciousness retained. Death *one hour and a quarter* from taking the medicine.	Inspection three days after death. Body healthy; contraction in feet continued, but had gone off somewhat from the rest of the body; no disease in any part; heart contracted, and perfectly empty. The blood was fluid.	No chemical analysis of stomach or contents. (Medicine analysed.)
11	Case in Provincial Hospital, in 1848. 'Med. Times and Gazette,' April 28, 1855. A girl, æt. 12.	*One grain of pure crystallized strychnia in pill.* Soon afterwards there was violent sickness; convulsive spasms of a tetanic character followed. She died in *one hour and a half.*	No report of inspection. Death referred to some undiscovered disease of nervous system—when, four years afterwards, it was found that the bottle labelled "Valerianate of Zinc" from which the pill had been prepared, contained pure *strychnia!*	No report of analysis.
12	Case reported by Dr. Smith, of Forfar, occurred in May, 1851. 'Edinburgh Monthly Journal,' September, 1851, p. 234. An adult male.	Dose and symptoms unknown. A game-keeper, found dead; a phial labelled strychnia, poison, containing a white powder, lying near; diseased had not been seen for four days.	Body lying on face; hands firmly clenched; feet much extended; head considerably bent backwards; every joint rigid, and some muscles had the condition as if in powerful action during life; countenance livid, and somewhat swollen; dark-coloured fluid blood	Stomach contained no food, only a few ounces of fluid exhaling a strong spirituous odour; portion of contents boiled with dilute sulphuric acid; nitric acid added produced a light orange; tannin

* Dr. Warner's case is usually considered to represent the smallest dose of strychnia which has proved fatal. A case occurred in a London hospital, in October, 1853, in which it seems probable that a quarter of a grain of strychnia in one drachm of water, at one dose, destroyed the life of a woman, aged 36. The patient was affected with trismus, as the result of a burn, and had been treated with opium. The muscular system was relaxed, and the breathing was short and spasmodic. In ten minutes after the strychnia had been given, the respirations were increased, and almost immediately after the patient was seized with the most violent convulsions, the back being bent forwards (emprosthotonos), the arms raised, and the features contorted. After a time, these spasms ceased for the space of about a minute, they then recurred with extreme violence, and continued until death took place, in about an hour and three quarters. See 'Med. Times and Gazette,' April 15, 1854, p. 376. A patient of M. Andral suffered from the most violent tetanic convulsions from so small a dose as 1-12th of a grain of strychnia. There are probably some constitutions peculiarly susceptible of the effects of this poison.

No.	Authority and Date of Occurrence.	Dose taken and Symptoms observed. Period of Death.	Post-mortem Appearances.	Analysis and Results.
		issued on cutting scalp; blood-vessels of brain highly congested; bloody points in brain; choroid turgid; blood dark coloured and fluid throughout the body; lungs healthy, but gorged with blood; heart natural, both ventricles much distended; stomach presented a patch of congestion near cardiac extremity, small quantity of whitish powder adhering to membrane; abdominal viscera healthy; spine not examined.		caused a deposit of a gray-white sediment. The powder in phial gave similar results. Contents of stomach subsequently examined by Dr. Christison, acidulated with sulphuric acid, filtered; treated with milk of lime, concentrated to a thin syrup, and filtered again. The mixture dried at 212°, treated with boiling rectified spirit, and evaporated to dryness. Extract had intense bitter taste of strychnia, and turned bright yellow by active acid. The colour-test did not act characteristically. Dr. Christison remarks, "There is, in fact, a want of positive tests for strychnia when mixed with organic matters, unless the proportion were considerably greater than in this case, so as to admit of some complexity of chemical handling. I think there is satisfactory evidence for a case of suicide or accident. It may be doubted whether this chemical evidence, however, would be enough on a charge of murder, *in which there was no proof of the nature of the symptoms.*"
13	Case reported by Dr. Lonsdale, occurred November 28, 1854. 'Edin. Monthly Journal,' 1855. A strong man æt. 59.	*One grain and a half of strychnia* by mistake for jalapine. Symptoms in about half an hour; in three quarters of an hour, in violent spasms, subsiding at intervals, for from four to eight minutes; during spasms, violent shaking of whole body, which was extended, stiff, and rigid; spasms, at first, most marked in back and legs; in ten to fifteen minutes they fixed upon the thorax; violent tetanus supervened; fixation of all the muscles of respiration, in which state he died, in about *an hour* from the time of taking the poison. Diseased was anxious and agitated; his intellect perfectly clear; pupils slightly dilated; eyes protruded; jaw fixed; face and hands livid; surface cold. An hour after death, the arms were unnaturally rigid, and fingers inflexed, but not so as to grasp the palm.	Inspection thirty-six hours after death. Brain and medulla oblongata in natural state; heart healthy, *empty*, and unnaturally atonic; lungs much congested; stomach and bowels healthy; slight congestion of left kidney.	Stomach and contents examined on the ninth day after death. Contents amounted to one ounce, a thick grayish-looking fluid, having a slight acid reaction. Stomach and contents boiled in water, acidulated with sulphuric acid; carbonate of lime added to neutralize the acid; evaporated to dryness, and digested with rectified spirit; again filtered, and filtrate evaporated; liquid had consistency of syrup; a slight yellowish colour, and a distinct and persistent bitter taste. To the extract, sulphuric acid and bichromate of potash added, gave a purplish tint speedily changing to a permanent light green. This test, as well as the peroxide of lead and sulphuric acid failed to give any appreciable change of colour in a small quantity of the extract. Sulphuric acid and bichromate of potash added to an alcoholic solution of strychnia, produced a tinge of purple, rapidly succeeded by the green colour, like the effect on the extract from the stomach.
14	Case reported by Mr. D. G. M'Pherson, occurred at Bristol, in November, 1854. 'Med. Times and Gazette,' December 16, 1854. A male adult.	Dose and symptoms unknown. Found dead in bed, body warm; deceased was lying on his back, which was arched; the occiput was buried in the pillow; heels pressed into the bed; forearms flexed, and fists clenched upon the abdomen; toes drawn to the soles of the feet; eye bright, but not	Inspection eighteen hours after death. Abdomen warm, tense, and hard; body lying on its back, rigid; teeth clenched; eyes a dull, fishy appearance; forearms flexed, fists clenched; legs forcibly extended; bloody fluid issuing from mouth. Stomach and duodenum presented red spots of extravasation (con-	In diseased's box a phial was found labelled "Poison. strychnine, 10 grains;" and on the dressing-table was a glass with some broken crystals, which had the bitter taste of strychnia, and when tested by bichromate of potash and sul-

		prominent; pupils dilated; features placid; teeth firmly clenched.	gestion?); mucous membrane softened. Both lungs engorged; presenting black patches of pulmonary apoplexy; mucous membrane of trachea much congested, with extravasated blood on surface. Heart flabby; an ounce of black fluid blood in left ventricle; blood universally fluid. Brain and spinal marrow not examined.	phuric acid gave the purple colour of strychnia. The stomach contained about two ounces of thick fluid, in which were a few grains that, with the sulphuric acid and the bichromate of potash, gave the purple colour for a few seconds and then turned into a green, bilious-looking colour. The contents of the stomach and intestines were of a darkish buff colour.
15	Case reported by Dr. Geoghegan, in 'Dublin Med. Press,' occurred in July, 1855. A male, æt. 26. [A report of this case was not published until the 25th of June, 1856. (See the 'Dublin Medical Press' of that date.)]	*Five grains of strychnia.* Heard moaning in *fifteen minutes;* lying on back in bed; hands clenched; fore-arms flexed; one leg extended, the other in the act of being so convulsively; head drawn back. He died from *twenty* to *twenty-five minutes* from taking the poison.	Inspection eighteen hours after death. Body fresh, rigid, resting chiefly on back of head and heels; limbs bent with difficulty; feet extended; face calm; mouth slightly open, with dry brown matter on tongue, and froth of same colour adhering to the teeth; brain natural, its vessels containing but little blood; lungs moderately congested; the heart was firmly contracted, its cavities contained a very small quantity of dark fluid blood; mucous membrane of stomach softened, and presenting dark clay-brown patches; subjacent veins injected; contents partly digested food of a red-brown colour, acid reaction.	Filtered contents of stomach were strongly bitter. Contents (acidulated?) agitated with animal charcoal to remove the strychnia; this afterwards removed from charcoal by boiling rectified spirit; evaporated; dissolved in liquor potassæ, and agitated with ether by Stas's process. The ethereal extract leaves the strychnia sufficiently pure for testing, or the conversion of residuum into acetate of strychnia, and a repetition of the potash and ether. *a.* Alkaline reaction and bitter taste of ethereal extract. *b.* Marked colour reactions with sulphuric acid and bichromate of potash, peroxide of manganese and ferrocyanide of potassium. *c.* Characteristic and well-defined reactions by all the recognised fluid-tests, by ammonia and carbonate of soda (fine colourless crystalline needles), sulphocyanide of potassium (prismatic tufts), chloride of gold, perchloride of mercury, chlorine water, and tincture of galls. The acetic extracts of the finely divided tissues of the stomach, made at a later date, gave the peculiar coloration with the bichromate of potash; but faint and dubious indications with the other tests.
16	Case of John Parsons Cook; date November 20th, 1855. Æt. 28.	Dose taken unknown. Symptoms on Monday night, the 19th, about an hour and a quarter after some pills had been given by Palmer, violent screaming first heard; tearing of bed clothes with his arms; complained of feeling of suffocation; his head drawn back; moving, as by jumping or jerking, both	First examination six days after death. After death, body rigid, and hands clenched; feet turned inwards; abdominal viscera healthy; stomach contained some ounces of a brown fluid, at cardiac extremity some congestion, and minute yellowish-white specks on the mucous membrane; small intestines	Parts examined for strychnia;—coats of stomach, and (two ounces of bloody fluid from the jar containing it. Heated with dilute sulphuric acid and alcohol, filtered, evaporated; neutralized by carb. potash, evaporated, and digested in al-

No.	Authority and Date of Occurrence.	Dose taken and Symptoms observed. Period of Death.	Post-mortem Appearances.	Analysis and Results.
		in the head, and all over the body; difficult breathing; eyes projecting; gasped when he spoke, as if difficult for him; hands fixed and stiff, asked to be rubbed; twitchings in the arms and body during the rubbing; twitched all over; quite conscious; all the time recognised Palmer, and said "Oh, Palmer, I shall die;' had a difficulty in swallowing some pills which were given to him. In taking some liquid, he snapped at the spoon, and seemed to bite it very hard, his body was then jerking and jumping; snapped in same way at a glass containing a draught which was given to him by Palmer. When swallowed, it was vomited immediately, no pills could be found; fit lasted half an hour, then became composed (Mills's evidence.) Twenty-four hours after this attack, from which he perfectly recovered, seized with another and more severe attack, about an hour after taking two pills given to him by Palmer; started up; stiffness of neck, which he asked to have rubbed; swallowed two other pills (ammonia?); uttered loud screams; dreadfully convulsed in all the muscles of the body; opisthotonos; complained of suffocation; asked to be lifted up and turned over; could not be done owing to rigidity of the whole body; quite conscious; heart gradually ceased, and he died tranquilly, about *one hour and a quarter* after taking the pills.	contained a bilious fluid; kidneys congested, right larger than the left; larynx stained with dark blood; lungs contained much fluid blood, accounted for by gravitation; heart natural size, and healthy, its cavities were empty; blood throughout body fluid, and uncoagulated; brain and spinal marrow healthy; dura mater of brain congested. Second examination two months after death. Body and limbs still very rigid; hands closed firmly, putrefaction not much advanced; spinal cord and canal examined, both quite healthy.	cohol; alcoholic liquid evaporated, and tested by taste, as well as by sulphuric acid and bichromate of potash, a slight purple colour produced, but no satisfactory evidence of strychnia. Antimony found in these parts. Two drachms of blood (the whole quantity sent), antimony found therein. Liver, spleen, kidneys, and lungs, examined only for mineral poison. Antimony alone found in small quantity, in all the parts submitted to examination.

In examining this table of deaths from strychnia, it will be perceived that of the fifteen fatal cases which I have been able to collect by searching authentic records, extending over a period of nineteen years, eleven only, prior to the case of Cook, have occurred in this country. In seven of these cases no analysis was made. In Dr. Blumhardt's case (No. 2), although so much as forty grains had been taken, and the patient died in one hour and a half, no strychnia could be found either in the stomach in an unabsorbed, or in the blood in an absorbed state. Although the colour-tests for strychnia were not then known, yet the most delicate test for this poison, namely the *bitter taste*, was accessible to the analyst. In fact, according to the recent observation of Dr. Christison, the absence of bitterness is the best negative test of the absence of strychnia. The case is further remarkable from the fact, that although one of the oldest authentic cases on record, there has been none in which the symptoms and appearances have been more accurately or minutely recorded. It appears from this history, that the patient, a young man, must have taken a much larger dose than Cook, and he died from its effects in about the same period of time; yet, although a special research for the poison was made by a competent person, who had access to the stomach and contents in an unmutilated condition, *not a trace of strychnia was found in the stomach, in its contents, or in the blood.* In case No. 5, except by the bitter taste, there was no evidence of strychnia, and the sulphuric acid is stated to have produced a rose pink colour, without any addition of bichromate of potash. The effect was such as would be produced by salicine and not by strychnia. The tests applied, in the case No. 8, cannot be said to have demonstrated the presence of strychnia in the stomach. In case No. 12, examined by Dr. Christison, the tests applied are tests for brucia, and not for strychnia. Although the man had evidently died from a large dose of strychnia, the colour test did not reveal this, and it is properly stated that such chemical results as these would be of no value, unless there was *proof* from the *nature of the symptoms.* In No. 13, the colour tests were applied to the stomach and contents, and gave some, but not conclusive, evidence of the presence of the strychnia. Strychnia is peculiar in not rapidly reducing chromic acid to the state of green oxide of chrome, and yet this appears to have been the most striking and prominent colour produced, a result owing to the presence of alcohol or organic matter, and probably the high temperature, caused by the admixture of sulphuric acid. No. 14 is the only case reported to have occurred at Bristol, which I have met with, and it is probably the case referred to by Mr. Herapath, in his evidence. Strychnia was here found in the contents of the stomach by the colour-tests, but the presence of organic matter appears to have affected the results. The case presented no difficulty. A large dose of the poison had been taken—some crystals were left in a drinking glass—the stomach and contents were properly preserved—and there was no poison but strychnia to engage the researches of the analyst.

No. 15, the case reported by Dr. Geoghegan, as having occurred in July, 1855, has been published by this gentleman since the case of Cook has drawn general attention to the subject; it is the only one in the table in which strychnia was clearly and unambiguously detected in the stomach, not merely by the colour test, but by those other corroborative characters which render the demonstration of the poison conclusive and satisfactory. It was found in the contents of the stomach and in the coats of that organ; but, as Dr. Geoghegan properly remarks, this must not be regarded as absorbed strychnia, but rather as imbibed from the fluid contents of the stomach. In forming an opinion regarding an analysis, however, it is always necessary to consider the circumstances attending the case. In Dr. Geoghegan's case, the large dose of *five grains* was taken,—there was no vomiting, and the person was dead in *twenty-five* minutes. This gentleman also had, beyond doubt, the contents of the stomach for the purpose of his analysis.

I have records of many other cases of poisoning by strychnia, in which persons have recovered, and one case which has occurred since that of Palmer, in which I am informed that strychnia was detected both in the contents of the stomach and in the blood. The cases of recovery, with one exception, do not throw any light on the question we are now considering, namely, the detection of strychnia in the body. The exceptional case is, however, too remarkable to be altogether passed over. It occurred to a patient in St. Bartholomew's Hospital: the analysis was made by Dr. Stenhouse, Professor of Chemistry in that institution, well known for his researches in organic chemistry. A man having taken strychnia medicinally, attempted suicide by swallowing at once *four grains*, mixed with four grains of morphia, dissolved in one ounce of spirit. The usual symptoms appeared in rather more than half an hour. He was brought to the hospital *one hour* after he had swallowed the poison; and by the aid of the stomach-pump, three or four ounces of animal charcoal mixed with water, were injected as an antidote. "The stomach was completely emptied, and during the whole time occupied by this proceeding (twenty minutes), he had no convulsion." The contents thus withdrawn, under the most favourable circumstances, were examined by Dr. Stenhouse, but we are informed "he did not detect any of the strychnia." The patient, it appears, had short paroxysms at intervals after the removal of the contents of the stomach, showing that his system was still under its influence, probably owing to the portion of poison which had been absorbed. The last convulsion occurred three hours after his admission. From that time the recovery of the patient was complete. (Report of the Abernethian Society, 'Medical Times and Gazette,' April 28, 1855, p. 423.) This case merits a little consideration in reference to the alleged certainty of detecting strychnia in the stomach. It presents us with a simple fact and not a mere speculation. The analysis was performed by a gentleman who has devoted more attention than most chemists in London or the pro-

vinces, to organic analysis, and the very means were used,—animal charcoal—for fixing the strychnia, which are recommended by Graham and Hofmann as the most certain and satisfactory. In fact, they were such as many analysts of experience would have employed, supposing the man to have died at the time the stomach-pump was introduced. Nothing is more easy, as experiment will show, than to procure strychnia from animal charcoal thus employed, by the use of rectified spirit; but, although, *four grains* of strychnia had been swallowed, and only an *hour and twenty minutes* had elapsed, not a trace of the poison could be detected in the contents of the stomach. Is it to be supposed that Dr. Stenhouse would have been more successful, in this instance, had he operated on these contents in the dead body in place of the living? I see no reason for coming to this conclusion, and, whatever theory we may advance to account for its disappearance, whether by absorption or decomposition, the fact must be taken to prove conclusively, that a large dose of strychnia may in some instances entirely disappear from the stomach in little more than an hour. It may appear surprising that the man should have recovered at all after having taken so large a dose, but it is to be observed that the medicinal dose of strychnia which he had been in the habit of taking for two weeks, had reached half a grain. A report of this case was read before the Abernethian Society, in April, 1855,—a society which adopted the unusual course of prematurely criticising and condemning, on newspaper reports, the evidence of the medical witnesses for the crown, in the case of Palmer. Their own records would have shown them, that in one material point at least, the medical witnesses were right, and they were wrong; and the verdict of the jury should teach them caution in the future discussion of such matters.

If we refer to toxicological authorities we shall find that there is not one who supports the statement of the chemists for the defence, that, in cases of poisoning strychnia is not only easily detected in the stomach, but that no conceivable case of poisoning can occur by it in which its presence cannot be determined in the dead body by chemical tests. Dr. Christison, in the latest edition of his work, gives no special process for detecting strychnia, but under the head of nux vomica, observes, "Contrary to what takes place in regard to vegetable poisons generally, nux vomica is often found in the stomachs of those poisoned with it." He does not refer to any case in which pure strychnia or its salts, taken as poisons, have been found after death in the stomach or tissues.

[The conclusions which we may draw from this inquiry are,]

1. That strychnia may be found in the stomach, as in other cases of poisoning, when it has not been entirely absorbed, and the stomach and contents have been properly preserved for analysis.

2. That in some cases, when given in small doses, and in other cases even in large doses, although it may be detected in the stomach, it cannot be detected in the absorbed state in the blood and tissues.

3. That there are no facts derived from experiments on animals or from observations in the human subject, to justify the statement that in *all* cases of poisoning by strychnia, the poison must, by proper chemical processes, be certainly detected.

4. That in strychnia-poisoning, as in morphia and other forms of poisoning, a person may live a sufficient time for the poison to be entirely removed from the stomach, and in this case he may die without a trace of strychnia being found in the blood, tissues, or any part of the body.

The rapidity with which strychnia is absorbed and diffused through the body, must vary according to many circumstances. An experiment of Dr. Macadam's shows that the poison not only may pass into the blood, but that it passes out again by the kidneys in the very short period of *nine minutes*. This may happen, provided the poison comes in contact with the surface of the stomach, and there is no mechanical or other cause to interfere with its absorption. On the fact of its diffusion, there is one set of experiments by Mr. Blake: he found, on introducing the nitrate of strychnia into a vein, that the action of the poison on the spinal cord was manifested by tetanic convulsions in sixteen seconds in the horse, in twelve seconds in the dog, in six and a half seconds in the fowl, and in four and a half seconds in the rabbit. Severe symptoms cannot be produced until the poison is diffused through the circulation; and the more rapidly it enters the blood, the more speedily do the effects appear. This shows how largely absorption must be concerned in the operation of the poison. Dr. Christison killed a dog in *two minutes*, with the sixth part of a grain dissolved in alcohol, injected into the chest, and a wild boar was killed in *ten minutes* with one third of a grain. An instance has been privately communicated to me, in which a man died in *ten minutes* from a dose of ten grains! This is the most rapid case of death yet known; and there must have been here very speedy absorption and diffusion. Dr. Harley injected one twelfth of a grain of acetate of strychnia in solution, into the jugular vein of a full-grown dog; in *four seconds* the animal became tetanic, and in twenty-eight minutes it died.

In reference to the rapid *elimination* of the poison, we have the evidence of those gentlemen who state that they have found it in the urine. In Dr. Macadam's experiment it was found, as above stated, in the urine of a dog to which half a grain of strychnia had been given on liver, only nine minutes before. The remarkable feature in this experiment is, that no symptoms of strychnia-poisoning had up to that time manifested themselves in the dog. Hence, assuming that there was no fallacy, it follows that the poison begins to be thrown off by the blood before this fluid has acquired a sufficient quantity by absorption and accumulation, to produce symptoms.

This statement is important in reference to poisoning by strychnia, since the collection and examination of the urine while the person is living, might, according to the results of this experimentalist, furnish

evidence of the poison being in the system. It also opens to view another question in reference to a supposed *partial change* in the poison, during its distribution through the circulating system. This is what may be called decomposition. Dr. Macadam's experiment clearly shows, that strychnia, as such, may be in the blood in sufficient quantity to be thrown off by the urine, and to be detected in that fluid, and yet no symptoms of strychnia-poisoning will exist. To what can this unexpected result lead? It appears to me to be one of two conclusions: 1st, either that the blood is not sufficiently saturated with strychnia to produce the usual effects on the spinal marrow; or, 2ndly, that in poisoning by strychnia, a certain time elapses before the blood undergoes such a change by the presence of the poison, as to cause the symptoms peculiar to strychnia-poisoning.

It will be desirable, before speculating on this point, to refer to a few facts regarding the detection of strychnia. In the experiments performed by Dr. Christison and myself, in which a quarter of a grain of strychnia was given to rabbits, a small quantity, the surplus of that which had gone into the blood, was detected in the stomach, but not a trace in the blood or tissues. In Dr. Harley's experiments, just now related, a dog was killed by the twelfth of a grain of acetate of strychnia, injected into the jugular vein. This gentleman states that he lost no time in making a minute examination of the blood. He employed Dr. Marshall Hall's physiological test for this purpose, but although this is an exceedingly sensitive test, there was no effect; thus showing that there was no strychnia in the blood. The poison, therefore, in these cases, must have been either decomposed, or so diffused that the quantity was too small to admit of detection. Other facts of a similar kind might be quoted. The result of the above experiments is, that when introduced directly into the blood in *minimum* fatal doses, strychnia cannot be found in that fluid, even when death has occurred in twenty-eight minutes. When introduced into the stomach in *minimum* fatal doses, after variable periods, there may be sufficient left in that organ to enable the experimentalist to say that strychnia is present, but not a trace can be found in the blood or any parts of the body. Again, when strychnia has been given medicinally, it cannot always be found in the urine.

What becomes of the strychnia? Is it that there is a limit to the action of the tests, beyond which they cease to reveal its presence, although it is there; or is it to be admitted that it has undergone a change? The theory put forward in the defence, that strychnia is as unchangeable in the animal body as rock-crystal would, if it were well founded, forbid our entertaining the first supposition. Tests which act up to the 50,000th of a grain upon a substance that is perfectly indestructible, and even resists the action of oil of vitriol, can never be supposed to fail! The only conclusion is, then, that the poison must have undergone some change, owing to which it can no longer be reproduced as strychnia.

There are some facts in support of this view, derived from the recent experiments of Drs. Macadam and Harley. Dr. Harley found that the flesh of animals killed by *minimum* doses of strychnia, did not act as a poison to other animals. He fed a hedgehog on poisoned flesh for a period of fourteen days, without being able to detect the slightest symptom of poisoning. The poison must, therefore, he concludes, have been either decomposed, or it was not present in sufficient quantity.

I have already had occasion to refer to Dr. Macadam's experiment. He killed a horse with thirty-two grains of strychnia, which can hardly be called a minimum dose. He fed a large-sized terrier dog for two weeks on the flesh of this horse; the animal eating every day during this period two pounds of muscle. The terrier dog, he says, lived and throve on the flesh, and did not betray the faintest shadow of tetanic symptoms. He states that, on analysis, he found distinct evidence of strychnia in the muscle and blood of the horse.

These results appear to me to favour the view that strychnia, when absorbed and diffused through the circulating system, undergoes some change, by which, although part of it may still exist as strychnia, a portion is so altered or decomposed, that it no longer possesses a poisonous action on animals. Either this view must be adopted, or we must be prepared to say that strychnia, unabsorbed or as it is lying in the stomach, is a poison; but when absorbed and deposited in the tissues, although still existing entirely as strychnia, it ceases to exert a poisonous action.

Does strychnia produce any change in the blood? By some, the dark colour and fluidity occasionally observed in this liquid, are ascribed to the direct effect of this and other alkaloidal poisons. I have frequently examined the blood of animals poisoned by strychnia by the microscope, but could perceive no change in the globules. In a fatal case of poisoning by this substance which occurred to Dr. Ogston, he states that the blood-globules under the microscope appeared swollen, and their outline irregular; but this, he thinks, may have been due to spontaneous changes after removal from the body. In Dr. Blumhardt's case, (No. 2 in the Table), it was observed that the blood drawn while the patient was living and labouring under the effects of the poison, presented some peculiar characters. It came from the vein dark-coloured, and of tarry consistency; and there were contained in it a number of minute bladders of gaseous matter, appearing to indicate that it had undergone chemical change.

That strychnia acts as a poison, by producing some change in the properties of the blood, either vital or chemical, is, I believe, a generally received view among physiologists. There is no other conceivable theory which will explain its physiological action as a poison on the nervous system. To suppose that it alters or affects the blood without in itself undergoing some change, is contrary to the generally admitted doctrines of chemistry. It is also contrary to our knowledge of the chemical properties of strychnia and the alkaloids. The extraordinary

changes of colour which strychnia undergoes by contact with sulphuric acid and the peroxides in the application of the colour-test, are properly ascribed to its combination with nascent oxygen. In taking oxygen from these substances, is it to be supposed that it undergoes no change in itself? Is it in accordance with the laws of chemistry, that A can affect B, without B affecting A? Are the coloured compounds of strychnia and oxygen still in the form of strychnia the poison, or have they undergone a change? The amount of this conversion in the application of the colour-test, is well-known to be dependent on the relative proportions of strychnia and nascent oxygen produced from the substances employed. An ignorant or careless manipulator might, it is true, on finding strychnia to be present, affirm that the alkaloid had undergone no change; when, in fact, part of it only was there, and part of it had become converted into other compounds, no longer possessing the properties of strychnia in its pure state. The application of this reasoning is obvious. There is in the blood nascent oxygen, or oxygen in a state of high chemical tension for combination with the carbon and hydrogen of the waste tissues of the body. Strychnia, as it passes into the blood by absorption, must have its molecules split infinitesimally. These molecules there meet with oxygen. Considering the remarkable affinity which strychnia shows for oxygen out of the body, would it be a matter of great surprise that it should combine with, and remove from the blood a portion of that element on which all vital actions and the proper secretion of nervous force depends? If the oxygen of the blood can combine with the carbon and hydrogen of the tissues, there is nothing to prevent its combination with the carbon and hydrogen of part of the strychnia. It is not necessary that the whole of the absorbed strychnia should be thus changed. The conversion of a part would satisfy the theory, and the altered blood would thus become the poison affecting the motor tract of the medulla oblongata, producing an increased secretion of the nervous force which excites the voluntary muscular system.

But there is another mode in which the blood may be affected. According to Mialhe, strychnia is one of those poisons which forms an insoluble compound with the alkalies of the blood, and it thus affects the organic constitution of this important fluid. Mr. Horsley considers, from his experiments, that strychnia enters into intimate combination with albumen, and that it is thereby so changed, in certain cases, as not to be discoverable in the tissues when it has caused death. I have elsewhere alluded to these experiments. Supposing these views to be confirmed by further observation, it is probable that strychnia, besides its assumed effects on the oxygen of the blood and its action on the alkalies in that liquid, may further influence the condition or proportion of the serum.

Liebig, writing in 1842, says, "With respect to the action of other nitrogenized vegetable principles, such as quinine, the *alkaloids* of opium, &c., which manifests itself not in the process of secretion, but

in phenomena of another kind, physiologists and pathologists entertain no doubt that it is exerted chiefly on the brain and nerves. This action is commonly said to be dynamic, that is, it accelerates or retards, or *alters* in some way the *phenomena of motion in animal life.* If we reflect that this action is exerted by substances which are material, tangible, and ponderable, *that they disappear in the organism*, that a double dose acts more powerfully than a single one, that after a time a fresh dose must be given if we wish to produce the action a second time; all these considerations, viewed chemically, permit only one form of explanation—the supposition, namely, that these compounds, by means of their elements, take a share in the formation of new, or in the transformation of existing brain and nervous matter."

Liebig, therefore, evidently considers that the alkaloids, under which head strychnia and brucia would be included when absorbed, undergo changes of conversion, and that their poisonous action on the body is really due to the changes thus produced.

As far back as 1824, many experiments on the loss of the alkaloids by absorption and by changes produced in the blood were made by Lassaigne, Dublanc, and other French chemists, the question having excited some interest in consequence of the trial and execution of Dr. Castaign. M. Dublanc gives the following as the results of his various experiments :—" When the acetate of morphia has been absorbed, it will no longer be found or produced in a crystalline form from any of the liquids or tissues of the animal body. It appears to me to be demonstrated that, during absorption, this alkaloidal salt is rendered so diffusible that the aggregation of its constituent molecules is destroyed, and I much doubt whether it will be possible to find reagents capable of restoring cohesion to these divided molecules, so as to cause them to reassume the crystalline form. I am led to believe that when crystallized morphia is produced from the liquids of the stomach it is only a portion of that quantity which has *not been absorbed.* With this exception it will be found only dissolved, and appreciable by no test except by the blood-red colour given by nitric acid."

Although this theory of the partial loss of alkaloids, by absorption and diffusion in the blood, has been before the scientific world for the long period of thirty-two years, and has been widely promulgated by Liebig and his disciples within the last fourteen years, it was described by Sergeant Shee and his chemical witnesses as something quite new, which they had all heard of for the first time at the trial of Palmer! Had any one of his professional advisers been known as a physiologist, or as ever having given attention to physiological chemistry, this statement might have excited surprise. As it is, it shows that theories propounded by well-known chemists of repute may be entirely unknown to those who are put forward as "adepts" in chemistry for the instruction of a court of law. It is not expected that gentlemen of the legal profession should be acquainted with these scientific theo-

ries, but it is expected that they should be better advised regarding them than they appear to have been on this occasion.

There are few physiologists who doubt that all poisons act through the blood, that they alter its physical or its chemical properties, manifested by fluidity and change of colour; and that the poisonous substance itself simultaneously undergoes a change. This has been established by experiment in reference to oxalic acid, alcohol, and sulphuretted hydrogen; and, according to the statements of Mialhe, the compounds of arsenic and phosphorus with hydrogen affect the vital properties of blood by the removal of oxygen. As an additional proof, M. Bernard has recently found that the cyanide of mercury is resolved into hydrocyanic acid in the capillary system of the lungs. There is, therefore, reason, from analogy, to believe that strychnia may undergo some change in this fluid. The fact that it can be demonstrated to exist in the blood and tissues proves nothing to the contrary, because this may be a portion of the unchanged or undecomposed poison. The question can only be determined by experiment; and it remains to be seen whether, under a *bonâ fide* minimum dose, the whole of the strychnia which has destroyed the life of an animal can be recovered from the dead body in its original state. This is by no means probable, if we may judge from careful experiments already made with minimum doses of the poison. It certainly was not proved, or rendered even probable, by the evidence given for the defence at the late trial.—*Guy's Hospital Reports*, 1856, *p.* 346.

[We wish we could afford more space for Dr. Taylor's admirable article on strychnia. It is the most learned paper on the subject which we have ever read, and in our humble opinion fully justifies this cautious and excellent man in all that he has said on this subject.—Ed.]

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